

# Journal

## OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

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\$15.00 per Annum

Single Copies, \$ .75 Prepaid in U.S.

Canada and Pan American Countries, \$15.50; Foreign, \$16.50

Published semimonthly at 600 S. Michigan Ave., Chicago 5, Ill., by the American Veterinary Medical Association. Second class mail privileges authorized at Chicago, Ill., January, 1956. Additional entry at Mendota, Ill.





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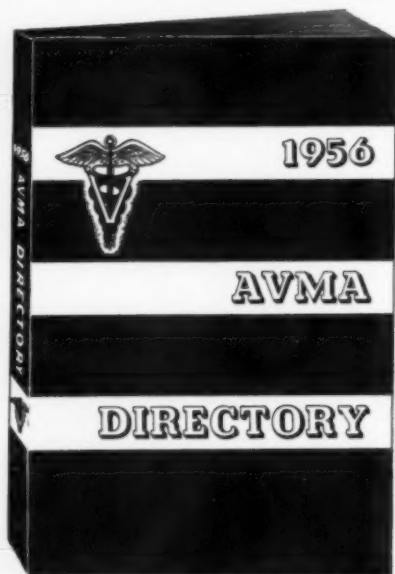
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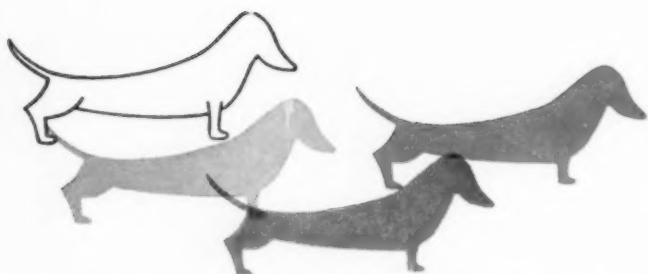
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1. Rachman, M., and Frucht, T. R.: Vet. Med. 49:341, 1954.



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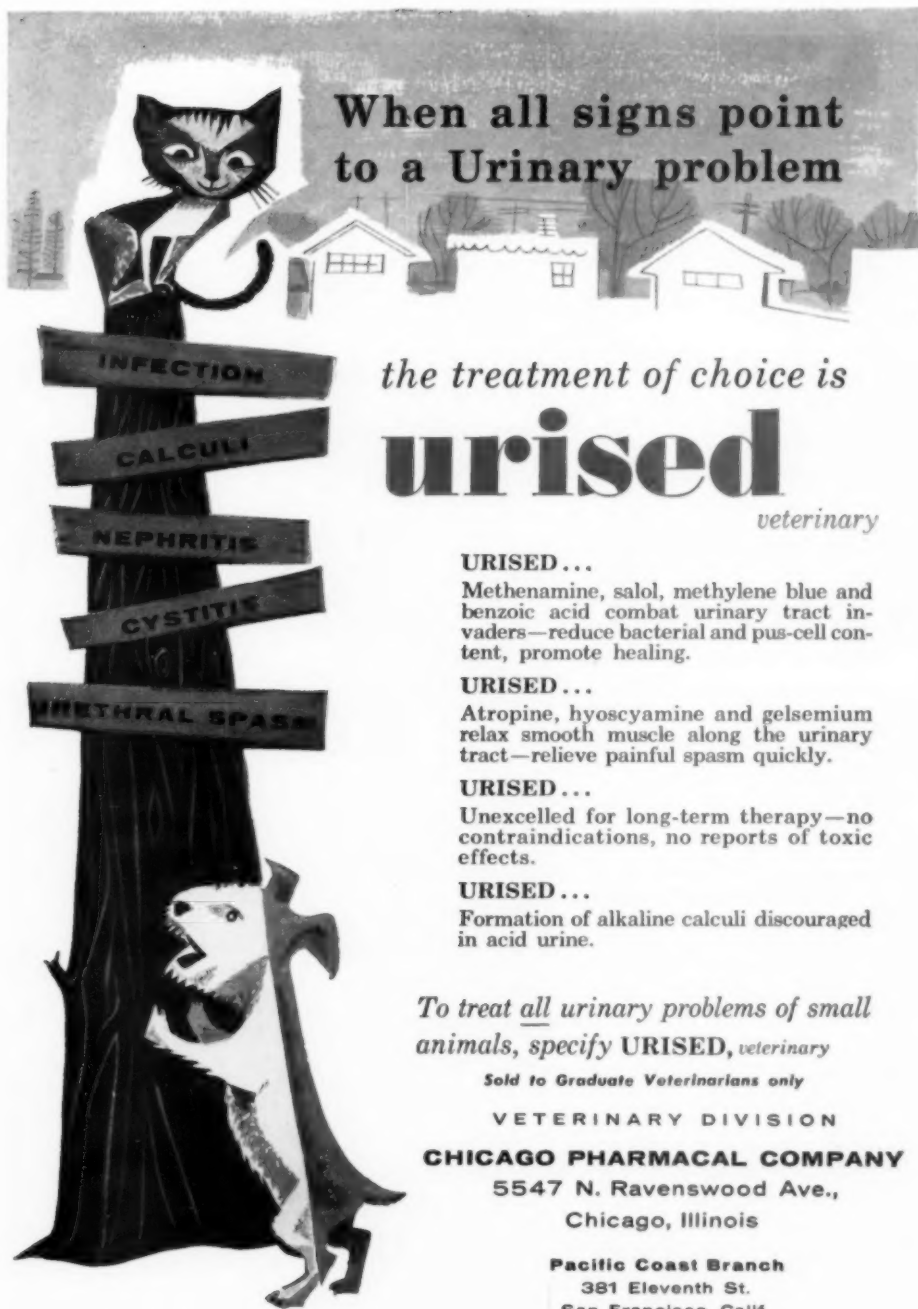
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# AVMA ☆ Report

## Veterinary Medical Activities

### Radio and Television Programs Featuring AVMA Members at the 93rd Annual Meeting in San Antonio

**KITE**—5-minute interview broadcast Monday, October 15, at 10:00 a.m.

Subject—Care of Dogs

Speaker—Dr. Jack O. Knowles

**KONO**—3- to 5-minute interviews to be taped Monday, October 15, for delayed broadcasts

Speaker

Subject

Dr. J. G. Hardenbergh

The Significance of the AVMA Convention and the Place of the Veterinarian in the American Economy

Dr. W. W. Armistead

How the Veterinarian Can Help Farmers and Ranchers Increase Their Livestock Profits Through the Control of Disease

Brig. Gen. W. O. Kester

The Role Of The Military Veterinarian

Dr. Kenneth D. Quist

Rabies from the Standpoint of the Farmer and Rancher

Dr. Frank A. Todd

The Veterinarian's Place in a Civil Defense Emergency

**KMAC**—5-minute interview to be taped Monday, October 15, for delayed broadcast

Subject—Veterinary Medicine, including the Many Ways in Which the Veterinarian Serves Mankind

Speaker—Dr. Dan J. Anderson

**WOAI**—4-minute interviews to be taped Monday, October 15, for delayed broadcast

Speaker

Subject

Dr. B. S. Pomeroy

Nonspecific Enteritis of Turkeys

Dr. A. K. Kuttler

Brucellosis

Dr. R. W. Moore

Blue Comb Disease

Dr. W. R. Pritchard

Virus Diarrhea

Dr. R. D. Turk

Internal Parasites

Lt. Col. K. F. Burns

Rabies

**KENS**—5-minute interviews to be taped Monday, October 15, for delayed broadcast

Speaker

Subject

Dr. C. D. Van Houweling

Bovine Brucellosis

Dr. J. P. Delaplaine

Progress in Treating Poultry Diseases

Dr. R. D. Radeleff

Progress in Treating Diseases of Sheep

Dr. W. T. Hardy

Drought Problems

**KENS-TV**—5- to 10-minute interview on a special AVMA 1/2-hour program telecast Monday, October 15, from noon to 12:30 p.m.

Speaker

Subject

Dr. Annelda Baetz

What the AVMA is—and what Veterinary Medicine Means to Mankind

Dr. Floyd Cross

Interviewed (Sat., Oct. 13) on the importance and value of veterinary care (5- to 10-min)

**KCOR-TV**—Three 15-minute interviews in Spanish

Speaker

Time

Subject

Dr. G. S. Trevino

6:45 p.m., October 15

What Veterinary Science Means to Mankind

Dr. A. Malaga-Alba

9:30 p.m., October 17

The Veterinarian's Place in Public Health

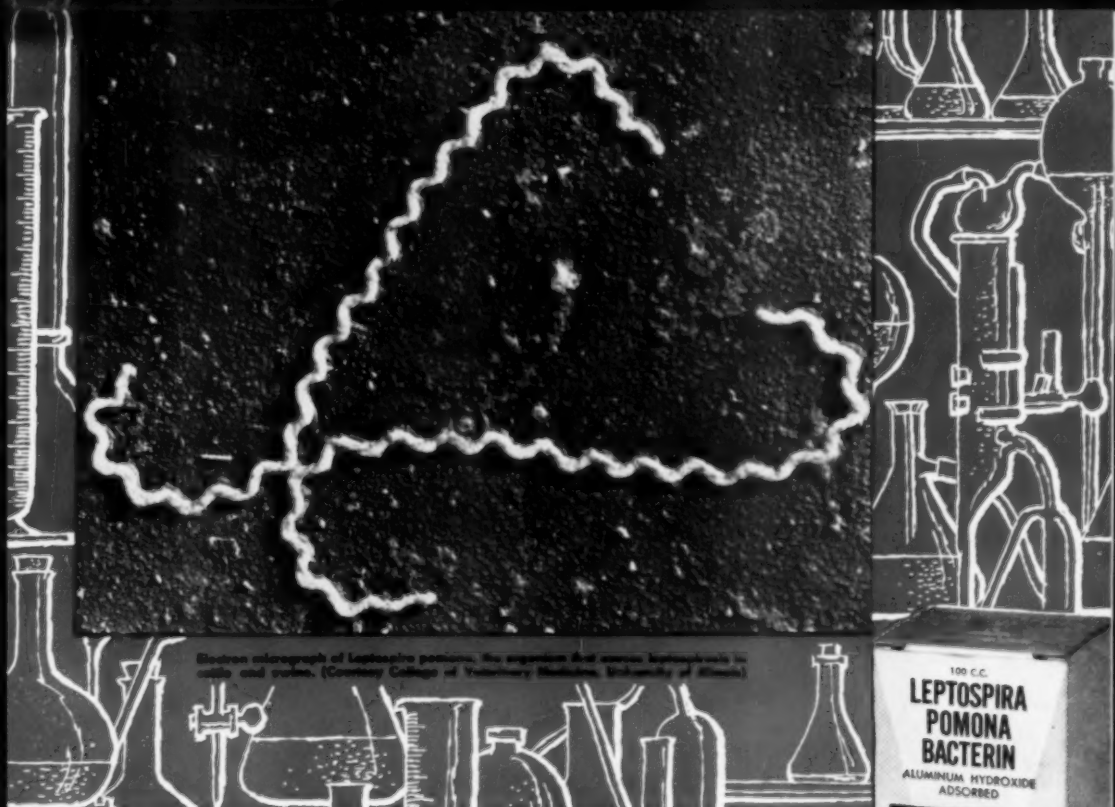
Dr. E. Nicholas

7:45 p.m., October 16

Care of Pets

**WGN (Chicago)**—1 1/2-minute announcement on a news program, 9:15 a.m., Monday, October 15

Subject—The 1956 Humane Act Award Winner



Electron micrograph of *Leptospira pomona*, the organism that causes leptospirosis in cattle and swine. (Courtesy College of Veterinary Medicine, University of Illinois)



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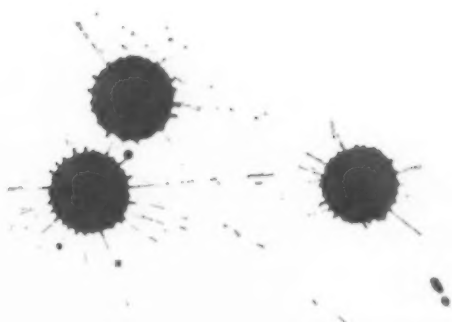
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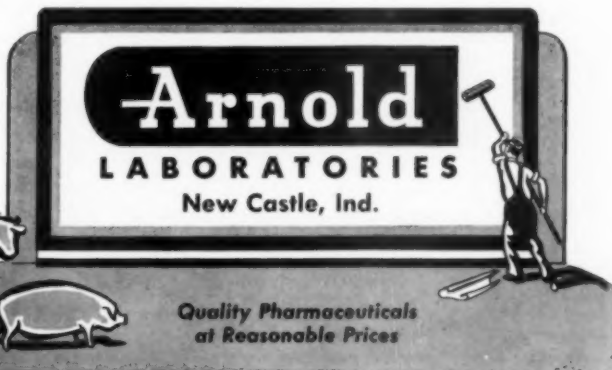
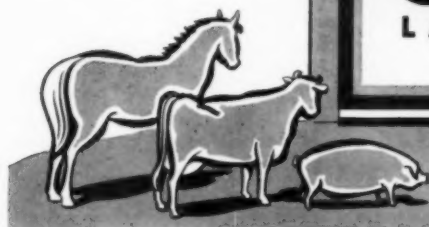
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# JOURNAL

of the American Veterinary Medical Association

Chicago 5, Illinois

Vol. 129

November 1, 1956

No. 9

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## Erysipelas in Pheasants

T. V. RAINES, D.V.M., and F. H. WINKEL, B.S.

Madison, Wisconsin

ERYSIPELOTHRIX RHUSIOPATHIAE is noted for its broad spectrum of host infectivity.<sup>1-3</sup> *Erysipelothrix rhusiopathiae* infection is reported relatively frequently in turkeys but seldom in other avian species. We frequently diagnose erysipelas in turkeys during the spring and fall,<sup>4</sup> but a diagnosis of erysipelas in pheasants in this laboratory is rare. In erysipelas in turkeys, as reported by Rosenwald and Dickinson,<sup>5</sup> the male birds are affected more often than are the females. We have also found this to be true in Wisconsin. To our knowledge, it has not been reported that cock pheasants are more often affected with erysipelas than are hen pheasants. It seems unlikely, under most circumstances of husbandry, that chickens would be less frequently or less heavily exposed than are turkeys. That the latter are more susceptible than chickens seems probable, but critical comparative data are lacking.<sup>6</sup> Vianello's<sup>7</sup> report is the only one which we have encountered on erysipelas infection in pheasants. This report is submitted with the hope that it may aid in ascertaining the prevalence of erysipelas in pheasants and in other species of birds.

### CASE REPORT

An owner of a large commercial pheasant farm submitted on Aug. 22, 1955, 1 dead and 2 live hen pheasants to this laboratory for diagnosis. There were 15,000 pheasants of various age groups on his premises. He was convinced that the birds were affected with botulism, and only after detailed ques-

tioning were we able to get a complete history.

Swine had been kept on these premises for the past ten years and, during most of this period, some of them were lame, with swollen joints on both the fore- and hind-legs. For the past five years, sheep had also been present to keep the grass down on the pheasant ranges. During the past year, 1 of the sheep was lame in the foreleg and had a swelling in the carpal region. Every autumn, for the past ten years, the owner observed that a large number of his cock pheasants became lame and died within a few days.

In late August, 1955, a disease condition developed in several 1-year-old hen pheasants in a group of 60 breeders which were being kept in a wire-covered pen. Lameness and black, well-formed feces had been the principal symptoms observed in the affected birds. The lame pheasants often spread their wings downward to the ground in order to keep their balance when walking. The infection spread to the 2,000, 12- to 13-week-old birds on the adjoining range. There was an approximately equal ratio of hens to cocks in this group.

The specimens submitted were hens from the 13-week-old group. On clinical examination of the live specimens, neither lameness nor swelling of the tibiotarsal joints were observed. Both birds tried to jump from the box in which they were submitted. They were completely free of clinical signs, in so far as we could determine.

On necropsy, the livers of all 3 birds were slightly enlarged and friable. Spleens of 2 birds were slightly enlarged with numerous necrotic foci, slightly smaller than a pinhead, on the surfaces.

Routine cultures were made of the hearts, livers, and spleens. Minute dew-

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The authors thank Dr. C. A. Brandly, University of Wisconsin, Madison, for referring this case to them and for his counsel on control measures.



drop-like colonies were observed on blood agar plates and bactotryptose agar plates after 24 hours of incubation at 37 C. The growth on the blood agar plates was *beta* hemolytic and, on microscopic examination, numerous gram-positive, nonsporulated, nonmotile, small, slender rods were seen. On biochemical tests, the recovered organism was unable to ferment sucrose and mannitol; it produced acid but no gas from dextrose, lactose, and maltose. The organism was catalase-negative, and it failed to produce hydrogen sulfide. These features indicated that the organism recovered from 2 of the 3 specimens was *Ery. rhusiopathiae*. This organism was found to be penicillin- and dihydrostreptomycin-sensitive by *in vitro* sensitivity tests.\* A diagnosis of erysipelas was made on the basis of these findings.

#### TREATMENT

It was suggested that sick birds be given 50,000 units of procaine penicillin intramuscularly. Pheasants are difficult to catch and restrain and are cannibalistic. When 1 becomes ill, the well birds attack and kill it almost immediately. Therefore, all birds in affected groups were given penicillin and all birds in the other groups were vaccinated with 1 cc. of duovax.† Death losses stopped almost immediately, and there have been no further signs of erysipelas in pheasants on these premises.

#### DISCUSSION

Although erysipelas was not diagnosed in the swine or sheep kept on these premises, one wonders if these were not the source of the erysipelas infection. Until recently, it was more prevalent in cock pheasants; however, this time it began in a pen of breeder hens in which no cocks were present. Although this recent infection was more acute than any previously experienced, only 200 birds died before the disease was brought under control. Since the owner did not desire to dispose of his sheep, and since we believe the premises are probably seeded with this organism, we advised that the pheasants be vaccinated every six months. The swine have been removed.

We have since diagnosed *Ery. rhusiopathiae*

*thiae* septicemia in a large turkey flock in which the organism was penicillin-resistant but was dihydrostreptomycin-sensitive, both *in vivo* and *in vitro*. We, therefore, routinely examine all recovered *Erysipelothrix* organisms for *in vitro* antibiotic sensitivity.

#### SUMMARY

Erysipelas was diagnosed in a large commercial pheasant farm. Clinical signs of erysipelas, in the 3 birds submitted, were absent or so slight that they may have been overlooked. Penicillin therapy seemed to control this infection. Necropsy and bacteriological findings are discussed.

#### References

- \*Udall, D. H.: The Practice of Veterinary Medicine. D. H. Udall, Ithaca, N. Y., 1947.
- †Hagan, W. A., and Bruner, D. W.: The Infectious Diseases of Domestic Animals. Comstock Publishing Assoc., Ithaca, N. Y., 1951.
- ‡Biester, H. E., and Schwarte, L. H., editors: Diseases of Poultry. Iowa State College Press, Ames, 1952.
- §Runnels, R. A.: Animal Pathology. 5th ed. Iowa State College Press, Ames, 1954.
- ¶Rosenwald, A. S., and Dickinson, E. M.: Swine Erysipelas in Turkeys. Am. J. Vet. Res., 2, (1941): 202.
- ¶Evans, W. M., and Narotsky, S.: Two Field Cases of *Erysipelothrix Rhusiopathiae* Infection in Chickens. Cornell Vet., 44, (1954): 32.
- ¶Vianello, G.: Un-enzozia da mal rossino nei fogni. Clin. Vet., 61, (1938): 234.

The Soviet biologist, G. M. Boshyan, who claimed, in 1950, that bacteria and viruses were different forms of the same organisms and could be transmuted, was recently denounced by the Soviet minister of agriculture as having published unworthy data: T. D. Lyenko, who maintains that acquired characteristics could be inherited, was praised.—*Science*, Aug. 17, 1956.

*Draft Horses Continue to Decrease.*—A report on draft animals used on the world's farmlands indicates that the number of horses has decreased about 20 per cent in the past 15 years—from 74.7 million before the last war to 59.1 million in 1954. In the same period, the number of camels used as pack and draft animals, in Asia and Africa, has increased from 7.8 million to 9.7 million (24%). Meanwhile, the total number of tractors used is increasing about 500,000 per year, the greatest proportional increase being in the Far East.—*Vet. Rec.*, July 21, 1956.

\*Difco Bacto-Sensitivity Disks, Difco Laboratories, Detroit, Mich.

†Duovax is a whole killed culture of *Ery. rhusiopathiae*, aluminum hydroxide absorbed and concentrated, produced by Lederle Laboratories, Pearl Valley, N. Y.

# Massive Adrenal Hemorrhage in Young Calves

## A Report of Seven Cases

T. MOLL, D.V.M., Ph.D.

Pullman, Washington

HEMORRHAGES are observed in the adrenal cortex of man and dogs in various acute infections, as well as in connection with severe burns, vitamin deficiencies, and hemorrhagic diseases. In such cases, the adrenal hemorrhage is usually not considered sufficiently extensive to have functional or clinical significance.<sup>2,5</sup>

Extensive hemorrhage of one or both adrenals is occasionally found in infants who die within the first few days after birth. In many infants, this is ascribed to trauma to the vascular adrenal cortex during birth.<sup>2</sup>

Severe hemorrhages have also been observed in kids and foals that died during the first to second day of life.<sup>3</sup> In these animals, adrenal hemorrhages were the only lesions observed and bacteriological examinations were negative.

The Waterhouse-Friderichsen syndrome in man<sup>4,7,10</sup> is usually characterized by massive bilateral adrenal hemorrhage and is often associated with other purpuric manifestations. However, cases have been reported in man where only one adrenal was involved.<sup>1,9</sup> This syndrome is most common in children under 2 years of age, but may also occur in adults.

The initial symptoms in man are vomiting, abdominal pain, or diarrhea. Later, anorexia, moderate fever, flushed face, weakness, muscle flaccidity, hypotension, circulatory collapse, stupor, and coma may occur. Marked cyanosis is considered the outstanding sign during the later stages. Petechiae, rapidly increasing in size to macular hemorrhages, are observed in many instances. Moist lung râles with increased respiration rate and convulsions may likewise be observed. The course is rapid, and death usually occurs within 24

to 26 hours—seldom later than two days—after the onset of symptoms.

Necropsy usually reveals marked cyanosis, congestion and, in many instances, hemorrhages in various organs.

The most striking and constant finding is massive adrenal hemorrhage. Such adrenals are deep purple with a tense capsule due to marked enlargement. The cut surface may reveal many small hemorrhagic areas, or the entire gland may be a mass of ill-defined blood and tissue. The most severe damage is usually encountered in the middle and inner layers of the adrenal cortex.

### REPORT OF CASES

As far as can be determined, the above syndrome has not been described previously in calves. It is believed that the following 7 cases in calves correspond to cases in man.

A summary of pertinent clinical information of these cases is presented (table 1).

The calves were 3 to 42 days of age. All, except 1 (calf 6), were obtained for experimental use shortly after birth. They were raised under similar environment, fed the same ration, and rectal temperatures and

TABLE 1—Summary of Clinical Information on Calves with Adrenal Hemorrhage

Case No.	Age (in days)	Illness first observed		Termination	
		Date	Hour	Clinical condition	Time (hr.) <sup>a</sup> Type
1	3	3/9	a.m.	Weak, dehydrated.	9.0 Died.
2	4	4/11	a.m.	Subnorm. temp., diarrhea, dehydrated, comatose.	0.5 Died.
3	6	10/5	a.m.	Subnorm. temp., diarrhea, dehydrated, comatose.	4.0 Killed (comatose).
4	14	11/16	a.m.	Subnorm. temp., diarrhea, dehydrated, comatose.	10.0 Died.
5	21	11/14	a.m.	Weak, dehydrated.	9.0 Killed (comatose).
6†	21	11/28	a.m.	Comatose, dehydrated.	4.0 Died.
7	42	11/13	p.m.	Comatose, dehydrated.	9.0 Killed (comatose).

<sup>a</sup>Hours after illness first was observed.

†Brought in for necropsy.

Dr. Moll is with the Department of Microbiology, College of Veterinary Medicine, State College of Washington, Pullman.

These studies were aided by a contract between the Office of Naval Research, Department of the Navy, and the State College of Washington, NR 130-225.

Scientific paper No. 1471, Washington Agricultural Experiment Stations, Pullman; Project No. 1144.

The author expresses appreciation to Drs. G. R. Spencer and J. S. Dunlap for advice and preparation of the photomicrograph.

TABLE 2—Summary of Necropsy Findings in 7 Calves with Adrenal Hemorrhage

Alterations	Case No.						
	1	2	3	4	5	6	7
Congestion	General	General	General	General	General	General	General
Hemorrhage	Lung	Small intestine	Lung	Lung	Lung, heart	Small intestine	Lung
Edema	.....	.....	Lung perirenal	Perirenal	.....	.....	Perirenal
Other	.....	.....	Lung consolidation	Lung consolidation, liver necropsy	Liver degeneration	Liver degeneration	Lung consolidation
Bacteriological examination	E. coli (blood)	.....	E. coli (blood)	E. coli (lung adrenals)	E. coli (spleen adrenals)	.....	E. coli (spleen adrenals)

clinical observations were recorded twice daily (8 a.m. and 4 to 5 p.m.).

Severe clinical illness occurred abruptly; 5 were comatose and 2 were weak within 12 hours after seeming normal and healthy. All calves were dehydrated and 3 had diarrhea and subnormal temperature when illness was first observed. Four died and 3 were killed, *in extremis*, within ten hours after clinical illness was observed. In no instance was the course over 24 hours and in several it was considerably less.

A summary of necropsy findings is presented (tables 2, 3). All calves showed marked general congestion, hence the mucosae of natural openings appeared cyanotic and all organs were dark, swollen, and blood-filled. Hemorrhages in the small intestines, associated with blood-tinged intestinal content, were observed in 2, and lung hemorrhages in 5 calves (fig. 1).

Extensive perirenal edema, including the areas of the adrenal glands, was seen in 3,

while the adrenal glands were enlarged, swollen, and more or less discolored in all calves. The increased size was determined by comparison with adrenal glands of normal calves of the same age range.

Since the adrenal capsules usually appeared thick and edematous, the degree and extent of adrenal discoloration was considerably obscured (fig. 1). Thus, all except one of the adrenal glands involved appeared to have more or less extensive dark gray to purple-black areas beneath the capsule.

The cut surface showed bulging and diffuse or more or less extensive focal discoloration of the cortex. In some instances, the cut surface showed marked disruption of tissue continuity (fig. 1).

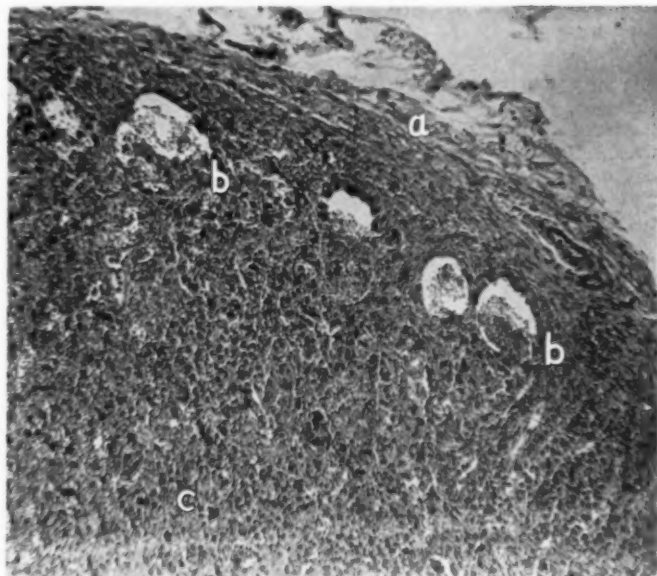
Microscopy showed extensive hemorrhage in the discolored areas of the cortex associated with necrotic tissue changes (fig. 2).

TABLE 3—Summary of Bilateral Adrenal Changes in Calves with Adrenal Hemorrhage

Case No.	Appearance		
	Gross	Cut surface	Microscopic
1	Enlarged; dark areas beneath surface capsule.	Dark brown areas in cortex.	Extensive areas of hemorrhages* in zona fasciculata.
2	Enlarged; grayish black areas beneath surface capsule.	Large reddish brown areas in cortex.	Extensive hemorrhagic areas in zona fasciculata.
3	Enlarged; purple-black areas beneath surface capsule.	Diffuse reddish black cortex.	Diffuse hemorrhage in zona fasciculata.
4	Enlarged; purple-black areas beneath surface capsule.	Diffuse dark brown cortex.	Diffuse hemorrhage in zona fasciculata and reticularis.
5	Enlarged; left, pink-brown; right, dark brown.	Left, pink cortex; right, dark brown cortex.	Right, diffuse hemorrhage in fasciculata.
6	Enlarged; dark gray under surface capsule.	Diffuse dark red cortex.	Areas of diffuse hemorrhage in zona fasciculata and reticularis.
7	Enlarged; bluish purple areas under surface capsule.	Dark red cortex.	Areas of diffuse hemorrhage in zona fasciculata.

\*In all instances associated with signs of pyknosis or necrosis or more or less marked disruption of tissue continuity.

Fig. 1—Left (a) and right (b) adrenal glands (right adrenal transected) and lung (c) of a 6-week-old calf (case 7).



#### DISCUSSION

The clinical signs described for the Waterhouse-Friderichsen syndrome in man vary considerably. It is, therefore, difficult or impossible to make a valid comparison of the clinical findings in these calves with those reported in man. The clinical and pathological observations reported seem compatible with those observed in man; the brief course of the disease and the adrenal lesion appear to be typical.

Calves 1, 2, and 3 were young and the adrenal hemorrhage might be considered due to birth trauma. However, the hemorrhages appeared to be recent in all calves, and the clinical manifestations described in infants were lacking.<sup>2</sup>

Although the adrenal hemorrhage forms a striking finding in the Waterhouse-Friderichsen syndrome, it is still doubtful if the adrenal damage plays an important role. The chain of signs characteristic of the syndrome has been ascribed to bacterial invasion of the blood stream. The syndrome in man is most often associated with fulminating meningococcus septicemia. However, various other microorganisms have been incriminated such as streptococci, micrococci, *Escherichia coli*, *Bacillus pyocyaneus*, Friedlander's bacillus, *Hemophilus influenzae*, and *Neisseria flava* II.<sup>3,6</sup> In still

other instances, bacteria could not be recovered.

The hemorrhage has been thought to be a result of direct action of the bacteria or their toxins on the walls of capillaries.<sup>3</sup>

*Escherichia coli* was recovered from the

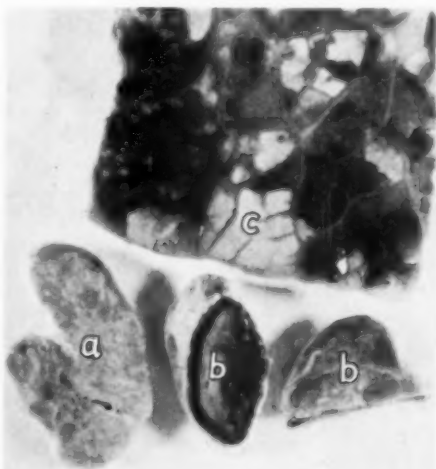


Fig. 2—Capsule (a), zona glomerulosa (b), and zona fasciculata (c) of right adrenal gland of a calf. x 100.

blood stream or adrenal glands, or both, of several of the calves reported here (table 2). Yet the etiological significance of these microorganisms may be considered doubtful.

Since several of the manifestations of this syndrome are reminiscent of acute adrenal functional failure, some investigators regard the adrenal hemorrhages as the cause of a particularly acute hypocorticism.<sup>8</sup> It has also been pointed out that the adrenal changes resemble those which have been experimentally produced by intense and acute stresses at a time when the adrenals were already enlarged and hyperemic due to pretreatment with lyophilized anterior pituitary tissue or chronic stress.<sup>9</sup>

#### SUMMARY

Seven cases of fulminating illness and death of young calves are reported. More or less severe adrenal cortical hemorrhage was observed at necropsy. The cases appear reminiscent of the syndrome known as "Waterhouse-Friderichsen syndrome" in man. This syndrome, as well as etiological aspects, are discussed.

#### References

- <sup>1</sup>Aegerter, E. E.: The Waterhouse-Friderichsen Syndrome, A Review of the Literature and a Report of Two Cases. *J.A.M.A.*, 106, (1936): 1715-1719.
- <sup>2</sup>Anderson, W. A. D.: Pathology. C. V. Mosby Co., St. Louis (1948): 1094-1096.
- <sup>3</sup>Casasola, L.: Emorragie surrenaliche in neonati nel quadro della c. d. sindrome generale dell'adattamento e delle malattie dell'adattamento. *Ann. d. Fac. Med. Vet.*, 7, 1954.
- <sup>4</sup>Friderichsen, C.: Nebennierenapoplexie bei Kleinen Kindern. *Jahrb. f. Kinderh.*, 87, (1918): 109.
- <sup>5</sup>Hoskins, H. P., Lacroix, J. O., and Mayer, K.: Canine Medicine. American Veterinary Publications Inc., Evanston, Ill. (1953): 266.
- <sup>6</sup>Lindsay, J. W., Rice, E. C., Selinger, M. A., and Robins, L.: The Waterhouse-Friderichsen Syndrome. Acute Bilateral Suprarenal Hemorrhage. *Am. J. M. Sci.*, 201, (1941): 263-270.
- <sup>7</sup>Little, E. G.: Cases of Purpura, Ending Fatally, Associated with Hemorrhage into the Suprarenal Capsules. *Brit. J. Dermat.*, 13, (1901): 445-467.
- <sup>8</sup>Selye, H.: The Physiology and Pathology of Exposure to Stress. Acta, Inc., Medical Publishers, Montreal, Canada (1950): 310, 322, 327.
- <sup>9</sup>Thomas, H. B., and Leiphart, C. D.: Septicemia and Purpura with Adrenal Hemorrhage in the Adult (Waterhouse-Friderichsen Syndrome). A Discussion of the Role Played by the Adrenal Gland in the Production of the Syndrome. Report of Two Adult Cases. *J.A.M.A.*, 125, (1944): 884-890.
- <sup>10</sup>Waterhouse, R.: A Case of Suprarenal Apoplexy. *Lancet*, I, (1911): 576.

#### Corn Smut in Silage

With reference to an abstract (*J.A.V.M.A.*, Jan. 1, 1956, p. 12) from *Hoard's Dairyman* (Aug. 25, 1955) that stated "smut is not harmful in silage," Dr. A. A. Case of the School of Veterinary Medicine, University of Missouri, Columbia, makes the following comment:

We have seen several herds where cattle developed the chronic ergotism syndrome after eating corn smut. The smut samples proved to have ergot activity—both biophysical (biochemical) and specific spectrographic absorption curves for ergot-like activity. Two herds are cited:

In a large Hereford herd near Tarkio, Mo., there were a dozen nursing calves with their ears and tails sloughing (dry gangrene); the smutted corn proved very active on canine, feline, and bovine uterine muscles. A fluid extract of the smut showed the ergot-like bands and absorption peaks. (We wish this latter test were more specific but, until we can standardize our procedures, it will have to do.)

Six full-grown Hereford cows, penned in a cornfield and eating large amounts of smut, near Monroe City, Mo., lost their rear hoofs and developed a classic chronic ergotism syndrome. The smut from these premises contained markedly active ergot principles.

Perhaps in both herds the smut was especially toxic, or perhaps the animals ate more smut than in the *Hoard's Dairyman* test. Fescue grass was not involved in either of the above herds, although similar cases are seen on certain Missouri farms where tall fescue grass is apparently an etiological factor.

Our work, both in ergot detection and on fescue poisoning, agrees with that reported from Colorado A. & M. College (*Am. J. Vet. Res.*, 17, (1956): 196-202).

It is evident that the toxic activity of smut, like that of ergot, may vary from lot to lot, from season to season, and possibly has many other variables. In 1954, smut in this area had both large amounts of an ergot-like principle and of a strychnine-like principle (hexane extract). That referred to in *Hoard's Dairyman* could have been very low in activity. If they had tried, at the 4-lb. level, several of the smut samples which we worked with in 1954, they probably would have had to get some more heifers to finish out their tests, although their results may be explained by the smut having been diluted by silage. The use of smut in childbirth was discontinued because its action was too unpredictable—more so than ergot. It also lowers blood pressure and doesn't reverse the renal threshold, as ergot is supposed to do. Both ergot and smut contract smooth muscles and, in bioassay tests, cause inflammation of the endothelium leading to thrombosis. We have used the bioassay test and then the ultraviolet-absorption spectrum test to support the bioassay findings. This problem requires more research.



## Lumbar Epidural Anesthesia in Cattle

L. E. ST. CLAIR, D.V.M., Ph.D., and H. J. HARDENBROOK, D.V.M., Ph.D.

*Urbana, Illinois*

SINCE THE introduction of caudal anesthesia in 1926 by Benesch,<sup>1</sup> other techniques have been developed to anesthetize the sacral and lumbar nerves in cattle.

Farquharson<sup>2</sup> developed a paravertebral lumbar method of nerve blocking in cattle for laparotomies, rumenotomies, and cesarean sections. The anesthetic was injected on the last thoracic and first two lumbar spinal nerves immediately distal to their emergence from the intervertebral foramina. He emphasized the value of anesthesia as a means of restraint and the desirability of being able to place the anesthetic in an area some distance from the operative site.

St. Clair<sup>3</sup> suggested that the teats could be rendered insensitive when paravertebral injections were made at the second, third, and fourth lumbar branches which form the inguinal nerve. Since the inguinal nerve does not traverse the flank, but passes between the psoas muscles, the anesthetic must be placed close to the intravertebral foramina.

A technique for anesthetizing the udder by paravertebral injections at the third and fourth lumbar nerves was described in 1955.<sup>4</sup> This is essentially the same technique that was used by St. Clair.

The paralumbar area may also be anesthetized for rumenotomy by injecting 10 cc. of 4 per cent novocain between the first and second lumbar vertebral spinous processes into the epidural space.<sup>5</sup>

While this manuscript was being prepared for publication, preliminary trials of segmental epidural anesthesia in cattle with methods and results similar to ours were reported.<sup>6</sup>

The fact that many practitioners have not been satisfied with the paravertebral lumbar technique prompted our further investigation of the lumbar epidural method of anesthetizing the flank. It was felt that this method could also be used to anesthetize the udder.

### ANATOMICAL CONSIDERATIONS

The paralumbar area is innervated by the ventral branches of the thirteenth thoracic and the first and second lumbar nerves. The lateral branches of the dorsal rami of the thirteenth thoracic and the first three lumbar nerves also supply the skin in this region. The arrangement of the nerves in this area has been described.<sup>2,3</sup>

The teats are innervated by the inguinal nerve, which arises from the ventral branches of the second, third, and fourth lumbar nerves. The ventral branches of the first two lumbar nerves, which traverse the flank, supply the anterior part of the udder above the teats. The perineal branch of the pudendal nerve ends in the skin posterior to the rear teats.<sup>3</sup>

Each nerve emerges from the spinal canal through the intervertebral foramen which is caudal to the arch of the vertebra

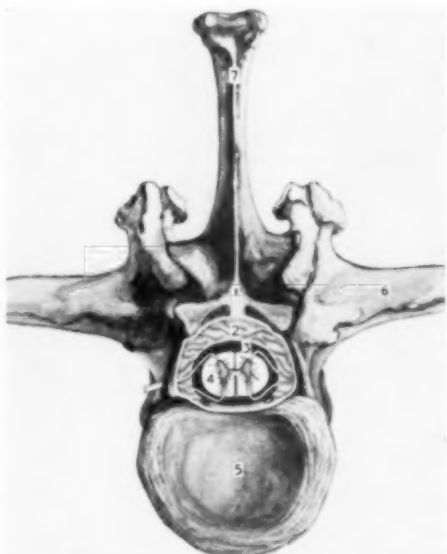


Fig. 1—A posterior view of the first lumbar vertebra showing the spinal cord and its associated structures in the vertebral canal: (1) interarcuate ligament, (2) fat in the epidural space, (3) subarachnoid space, (4) spinal cord, (5) body of the vertebra, (6) transverse process, and (7) spinous process.

From the Departments of Veterinary Anatomy and Histology and Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois, Urbana.

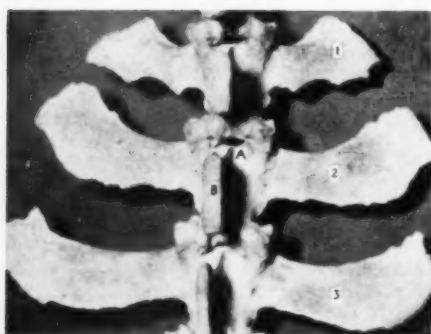


Fig. 2—Dorsal view of the first three lumbar vertebrae: (A) opening between the arches, (B) spinous process.

of the same number. In the thoracic and anterior lumbar regions, the intervertebral foramina are often double. In those instances, the nerve emerges from the anterior foramen of the pair.

The tip of the conus medullaris is at the caudal border of the second segment of the sacrum. The cone is elongated.

In the lumbar area, the epidural space is

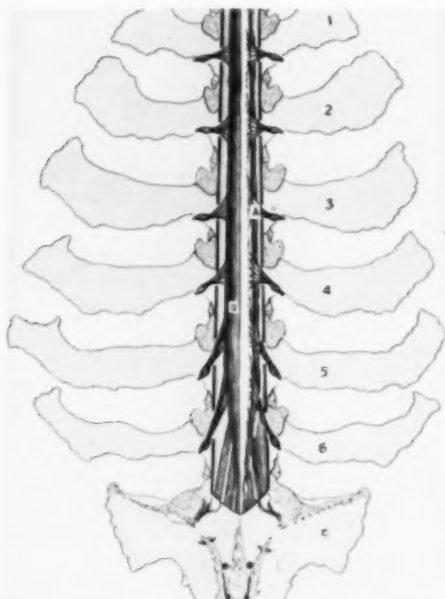


Fig. 3—Dorsal view of the lumbar vertebrae with arches removed to show the spinal cord and the spinal nerves: (A) bundles of fibers of the dorsal nerve root, (B) dura mater, and (C) sacrum.

about  $\frac{1}{4}$  inch in width. It is filled with fat except for vessels and strands of ordinary connective tissue (fig. 1, 2). Between the vertebral arches is a fatty, fibroelastic ligament, the ligamentum flavum (interarcuate ligament). It continues between the spinous processes as the interspinous ligament. In the space between the arches in the midline (fig. 1, 1), it becomes denser and is shaped like a bundle of wheat. It forms the roof of the epidural space at this point. The ligaments, in general, blend with the periosteum. The area in the midline occupied by the ligament is small in the anterior lumbar area (fig. 2, A) and is not present in the thoracic area. In the lumbar region it gradually increases in size to become largest between the last lumbar vertebra and the sacrum.

The width of the spinal cord, with the dura mater intact, is greatest at the level of the fifth lumbar vertebra. This is only slightly more than in the anterior lumbar area. The spinal cord and its dural sheath narrow rapidly as they enter the sacrum (fig. 3, B). The space between the dura mater and the spinal cord, which includes the subarachnoid space, continues almost to the caudal end of the sacrum. It is narrow as it courses through the sacrum. The dural sheath narrows more laterally than dorsoventrally. The spinal canal is largest at the lumbosacral junction.

The dorsal roots of the spinal nerves perforate the dura mater as four or five bundles of fibers arranged in a  $\frac{5}{8}$ -to 1-inch row. The fifth lumbar nerve bundles occupy the largest area (fig. 3). The ventral roots contain fewer, but larger, bundles than the dorsal roots. The area of emergence of the ventral root fibers from the dura mater is not as extensive as is the dorsal one. While the anterior bundles of the dorsal roots are directly above those of the ventral roots, the posterior bundles of the dorsal roots lie slightly behind the corresponding bundles of the ventral roots.

The second lumbar group of fibers is in the same transverse plane as the intervertebral foramen. The first lumbar and last thoracic roots incline slightly anteriorly to reach the foramina. The third lumbar fibers course slightly posteriorly. The others increase in their posterior extent to form the cauda equina. The dorsal and ventral roots join each other in the intervertebral foramen just beyond the dorsal root ganglion. The roots are very long in the cauda



equina. For example, the fibers of the first sacral nerve perforate the dura mater at the anterior portion of the sixth lumbar vertebra (fig. 3). The distance between the groups of root bundles as they perforate the dura mater increases from the sacral region forward. The sheaths derived from the dura mater to cover the nerve roots are thin, although the dura mater itself is tough and thick.

The bundles of fibers of the dorsal and ventral roots between the dura mater and the spinal cord are smaller and more numerous than those outside the dura mater. The line along which the rootlets emerge from the spinal cord is not interrupted between the consecutive groups (fig. 3, A). The area occupied by each group of fibers along the spinal cord increases from posterior to anterior. The first sacral nerve attachments to the spinal cord extend as far forward as the intervertebral foramen of the fifth lumbar vertebra. This is about 1 inch anterior to the area of emergence from the dura mater.

Laterally between the dura mater and the pia mater is the dentate ligament. It runs longitudinally, but it attaches to the dura mater at points between the consecutive groups of fibers.

On the floor of the spinal canal and associated with the periosteum are arteries and veins. An artery and a vein pass through each intervertebral foramen ventral to the nerve roots. Within the spinal canal the blood vessels from each side form anterior and posterior loops which course toward the midline at the body of the vertebra. There they anastomose with the corresponding vessels from the next foramen. The artery is medial to the vein. It is at the midline that the corresponding vessels from each side often join together.

#### OPERATIVE TECHNIQUE

The anesthetic is injected into the epidural space so that the nerve roots are bathed as they emerge from the dura mater. When it is desired that the left flank be anesthetized for rumenotomy, the last thoracic and first two lumbar nerves of that side require blocking. Since the incision is usually not close to the tuber coxae, the dorsal cutaneous branch of the third lumbar nerve is seldom involved.

The tips of the lumbar transverse processes, except the first and the last, can be palpated unless the animal is extremely

fat. To anesthetize the left side, the injection site is  $\frac{1}{2}$  to  $\frac{3}{4}$  inch to the right of the midline and the same distance posterior to a line connecting the anterior edges of the tips of the transverse processes of the second lumbar vertebra (fig. 5, B). The skin



Fig. 4—Equipment used in producing lumbar epidural anesthesia in cattle.

area is shaved or clipped and disinfected. A small amount of anesthetic is injected in the area to deaden it for the entrance of a  $\frac{1}{2}$  inch, 11- to 13-gauge needle. A 5- or 6-inch, 18-gauge spinal needle (fig. 4) is inserted through the larger needle. The point is directed downward, slightly toward the midline, and slightly forward between the spinous processes of the first and second lumbar vertebrae. When the anterior border of the spinous process of the second lumbar vertebra is contacted, the point of the needle is moved downward along it to the space between the two vertebral arches. The arch anterior to the space being slightly higher than the arch posterior to the opening, requires the needle to be pointing slightly forward (fig. 5, B). If the skin puncture site has been placed correctly, the needle will be about 12 degrees from perpendicular when it contacts the ligament that fills the opening between the arches of the two vertebrae. As pressure is applied to the needle, the resistance will indicate whether the point is against the ligament or the surrounding bone. The stylet may be removed either before or after the needle is pushed through the ligament into the epidural space. The needle will travel about  $\frac{1}{4}$  inch in perforating the ligament. Termination of resistance against the needle will indicate when it has entered the epidural space. A slight sucking noise can often be heard as the air first enters the epidural space. If a drop or two of anes-

thetic is placed in the needle, it will be aspirated into the epidural space when the ligament has been penetrated. The needle will not contact the dura mater until it has been pushed about  $\frac{1}{4}$  inch beyond the ligament. It should, however, be stopped before this point as the subarachnoid space should not be entered. If it is entered, cerebrospinal fluid will appear in the needle.

To make the injection, a 10-cc. Luer-Lok glass syringe is attached to the needle and, if the latter is correctly placed, the plunger will move almost by its own weight. Ten cubic centimeters of a 4 per cent solution of procaine is usually sufficient to produce the desired effect in an average-sized cow. The angle of the needle will tend to direct the solution across the midline to the nerve roots on the opposite side. If the needle is inserted closer to the midline and is, therefore, more nearly vertical, the solution might bathe the nerve roots on both sides, in which case more fluid would probably be required to produce the desired effect. The fluid spreads slowly because of the large amount of fat in the epidural space. However, the 10-cc. amount will usually bathe the dorsal and even the ventral roots of the last thoracic and first

two lumbar nerves. Up to 15 cc. may be used in larger animals. Since the position of the spinal canal will have a slight effect on the distance that the solution will travel, the procedure is based on the assumption that the vertebral column will remain approximately horizontal.

When teat surgery is to be performed, the second, third, and fourth lumbar roots must be reached by the anesthetic solution. The amount of fluid may be increased slightly to as much as 15 cc. to do this, or the injection site may be moved posteriorly one vertebra and the smaller amount used. When the fourth lumbar root is desensitized, the leg is somewhat weakened.

Satisfactory anesthesia usually develops in five to ten minutes and lasts about two hours. If it has not been obtained in 20 minutes, the injection may be repeated. The area anesthetized in the flank is shown (fig. 6). When only one side is anesthetized, the lumbar portion of the vertebral column tends to become convex on the anesthetized side.

#### DISCUSSION

A 4 per cent solution of procaine is preferred but 2 or 3 per cent solutions are satisfactory. The onset of anesthesia is

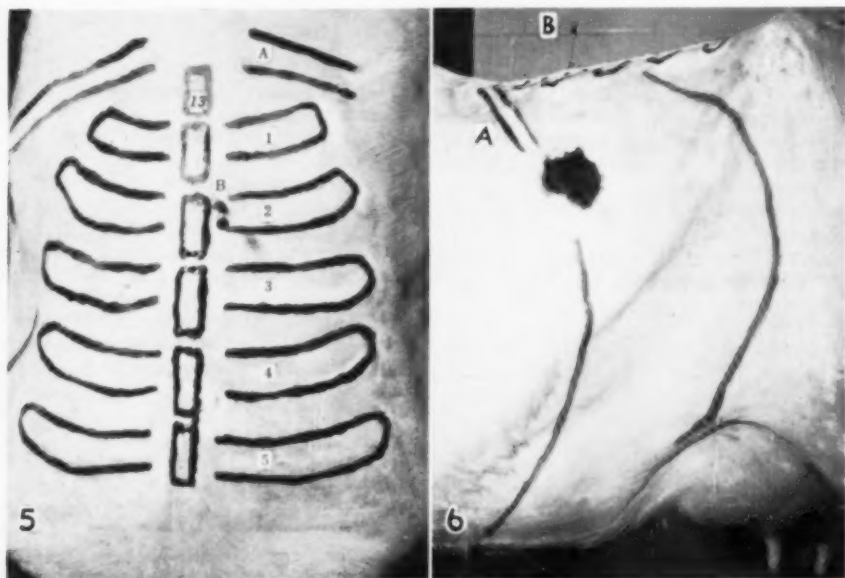


Fig. 5—Dorsal view of the cow with the bones drawn in outline and the needles in place: (A) last rib, (B) needles in place. The vertebrae are numbered.

Fig. 6—View of the left flank showing the anesthetized area (between the black lines): (A) last rib, (B) needles in place.

later and the duration is shorter with the weaker solutions. Adrenalin additives are not necessary.

In the many clinical and experimental animals anesthetized by this method, it was found that 10 to 12 cc. of a 4 per cent solution of procaine was sufficient to anesthetize the area in the average-sized animal. With 15 cc., the limb was usually weakened and with 20 cc. the animal was unable to stand; 5 cc. of a 5 per cent solution of cyclaine produced the desired state of local anesthesia. However, irregularities were found in some cases because of the difficulty of reaching the nerves with a smaller volume of fluid. Usually, 10 cc. of 2 per cent solutions of cyclaine or xylocaine produced satisfactory results.

Beef cattle generally require slightly more anesthetic than dairy animals.

The advantages of lumbar epidural anesthesia in cattle are:

1) The area is anesthetized by a single injection.

2) The injection is made at a place other than the operative site.

3) The landmarks are definite and can be easily located, but preciseness must be employed to assure satisfactory results.

4) No harmful effects have been observed during or following the procedure.

5) The anesthetic state is reached rapidly and is relatively long lasting.

6) Since the anesthetic is placed close to the spinal cord and upon the dorsal roots, all of the branches of the particular nerves are affected, except that the sensory fibers in the dorsal roots are more easily reached by the solution than are the motor fibers of the ventral roots.

7) Slight modifications in the technique for anesthetizing the flank will permit blocking the nerves to the teats.

#### References

<sup>1</sup>Benesch, F.: Eine Anästhesierungsmethode am stehenden Rind für das Albrechtsensche Verfahren der Sterilitätsbehandlung. *Wein. Tierärztl. Monatsschr.*, (Jan., 1926): 130-134.

<sup>2</sup>Farquharson, J.: Paravertebral Lumbar Anesthesia in the Bovine Species. *J.A.V.M.A.*, 97, (1940): 54-57.

<sup>3</sup>St. Clair, L. E.: The Nerve Supply to the Bovine Mammary Gland. *Am. J. Vet. Res.*, 3, (1942): 10-16.

<sup>4</sup>Baskirov, B. A.: Anesthesia of the Bovine Udder and Its Therapeutic Properties. *Veterinariya*, 32, (Jan., 1955): 74-77 (abstr. in *J.A.V.M.A.*, 128, (1956): 431).

<sup>5</sup>Magda, I. I., Shalduga, N. E., and Voskoboinikov, V. M.: Some Remarks in Connection with

Rumenotomy. *Veterinariya*, 29, (Oct. 1952): 47-51 (abstr. in *J.A.V.M.A.*, 122, (1953): 326).

<sup>6</sup>Arthur, G. H.: Some Notes on a Preliminary Trial of Segmental Epidural Anaesthesia of Cattle. *Vet. Rec.*, 68, (1956): 254-256.

#### Torsion of the Abomasum in a Cow

A 3-year-old heifer, five weeks after calving, suddenly developed anorexia, dullness, intermittent colic, and thirst. The next day, since she had not responded to therapy, a laparotomy was performed through the left flank. The rumen was found to be collapsed. The abomasum was tense, distended with fluid and gas and extended along the abdominal floor on the right side of the midline from the xiphoid to the pelvic region. After aspiration of much of the fluid and gas with a large intravenous needle attached to a rubber tube, both hands were inserted and the organ, which was rotated 180 degrees anticlockwise, was untwisted. Normal tonus soon returned. After the operation was completed, she made an uninterrupted recovery, except for some peritonitis.—*R. Richardson in Vet. Rec.*, July 28, 1956.

*Japanese Encephalitis Virus Causes Stillbirths in Swine.*—When Japanese encephalitis virus was injected, intravenously, into healthy, pregnant sows, death occurred in some or all of the fetuses, infection passing through the placenta. A viremia occurred in the sows after a latent period and the neutralizing antibody was rapidly produced.—*Vet. Bull.*, July, 1956.

*Diethylstilbestrol Implantation.*—Implantation of one to eight diethylstilbestrol tablets (15 mg.) in male and female chickens, 9 weeks old, produced little difference in the rate of gain but delayed sexual maturity. The adverse effect on semen volume, but not on egg production, increased with the dosage. Egg production was not affected five or six months after implantation. Hatchability was appreciably reduced at higher dosages.—*Poult. Sci.*, May, 1956.

*No Advantage for Spayed Heifers.*—In an experiment at Kansas State College, spayed heifers gained less than nonspayed controls. Feeding stilbestrol to spayed heifers increased their gains but they still did not gain as much as the controls.—*Kansas Stockman*, June, 1956.

# Chlorpromazine Hydrochloride as a Preanesthetic Agent for Pentobarbital Sodium Anesthesia in the Dog

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CHLORPROMAZINE hydrochloride\* is used widely in the treatment of certain types of mental diseases in man.<sup>4</sup> Due to its depressant action and potentiation of certain anesthetics, the compound has attained some usage in human medicine as a preanesthetic agent.<sup>1,2,7</sup>

Reports indicate that chlorpromazine hydrochloride is a valuable preanesthetic agent in canine surgery.<sup>3,5,6</sup> It was observed that the compound facilitated smooth induction and recovery from barbiturate anesthesia and reduced the amount of the anesthetic needed.

The following study was undertaken to determine the usefulness of chlorpromazine hydrochloride as a preanesthetic agent in combination with pentobarbital sodium.

## MATERIALS AND METHODS

Chlorpromazine hydrochloride (10-( $\alpha$ -dimethylaminopropyl)-2-chlorophenothiazine hydrochloride, a synthetic chlorinated derivative of phenothiazine, is a white, water-soluble, crystalline substance. It was administered in two forms: aqueous solution (0.5 or 2.5%) parenterally; and enteric-coated tablets (10, 25, or 50 mg.) orally. In this paper, chlorpromazine hydrochloride and pentobarbital sodium will be referred to as chlorpromazine and pentobarbital, respectively.

Healthy mature dogs of various breeds and ages were subjected to the experimental procedures. In one series of experiments (group 1), chlorpromazine alone or with pentobarbital was administered and the dogs were observed. In another series (group 2), dogs were given both drugs and were subjected to various major surgical procedures. Pulse, respiration, and behavior were recorded prior to chlorpromazine administration and there-

TABLE 1—Group 1—Nonsurgical Evaluation of Chlorpromazine Hydrochloride in Dogs

Expt. No.	No. of dogs	Dose (mg./kg.)	Route of admin.	Time* (min.)	Dose of pentobarbital sodium, i.v. (mg./kg.)	Results
1	5	3	i.m.	—	—	Slight depression and ataxia for 30 to 50 minutes.
2	5	10	i.m.	—	—	Slight depression and ataxia for 90 to 120 minutes.
3	5	—	—	—	8.8	Ataxia, sleepiness for 60 minutes; reflexes normal throughout.
4	5	10	i.m.	30	8.8	Light anesthesia for 30 minutes; strong reflexes by 40 to 50 minutes; anesthesia terminated in 60 minutes.
5	5	—	—	—	28.6	Deep anesthesia for 90 to 120 minutes.
6	2	5	i.v.	30	13.2	Deep anesthesia for 30 to 40 minutes.
7	6	10	i.v.	30	13.2	Deep anesthesia for 50 to 60 minutes.
8	6	15	Oral	120	19.8	Light anesthesia for about 120 to 150 minutes
9	2	—	—	—	19.8	Very light anesthesia for 40 to 50 minutes.

\*Between administration of chlorpromazine hydrochloride and pentobarbital sodium.

Dr. Brodey is an associate in veterinary surgery, University of Pennsylvania, Philadelphia, and Dr. Thordal-Christensen is on a leave of absence from the Department of Special Pathology and Therapeutics, Royal Veterinary and Agricultural College, Copenhagen, Denmark.

This study, supported in part by a grant from Smith, Kline, and French Laboratories, Philadelphia, Pa., was conducted at the School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

The help and advice of Dr. J. Martin, assistant professor, School of Veterinary Medicine, University of Pennsylvania, is greatly appreciated.

\*Thorazine, trademark, supplied by Smith, Kline, and French Laboratories, Philadelphia, Pa.

after at five-minute intervals during the observation period. Rectal temperature was recorded every 30 minutes. In dogs given pentobarbital, reflex activity and responses to surgical stimuli were also tested.

## RESULTS

The same 5 dogs were used in experiments 1 through 5. In experiments 1 and 2, the main effects of chlorpromazine were depression, ataxia, and hypothermia. No significant changes in pulse or respiration

TABLE 2—Group 2—Surgical Evaluation of Chlorpromazine Hydrochloride in Dogs

Exper. No.	No. of dogs	Dose (mg./kg.)	Route of admin.	Time* (min.)	Dose of pentobarbital sodium, i.v. (mg./kg.)	Results
10	3	15	i.m.	30	8.8	Anesthesia unsatisfactory in all 3 dogs.†
11	3	10	s.c.	40	13.2	Anesthesia for 25, 60, and 120 minutes respectively.
12	1	3	i.v.	40	8.8	Anesthesia unsatisfactory.†
13	2	3	i.v.	30	13.2	Anesthesia unsatisfactory in both dogs.†
14	3	15	Oral	120	13.2	Anesthesia for 30 to 40 minutes in 2 dogs and for 180 minutes in the third dog.

\*Between administration of chlorpromazine hydrochloride and pentobarbital sodium.

†Since surgical anesthesia was not produced by these combinations of chlorpromazine and pentobarbital, a full dose of pentobarbital was necessary.

were observed. In experiments 4, 6, 7, and 8, in which chlorpromazine was administered previous to pentobarbital, it appeared to exert a potentiating effect on pentobarbital.† Some of the dogs in these experiments appeared deeply anesthetized; however, no final conclusions concerning the suitability of the anesthesia could be drawn since the dogs were not subjected to any surgical procedure.

In experiments 6 and 7, chlorpromazine was administered intravenously over a two-minute period and immediate depression and ataxia, which lasted up to 30 minutes, were produced. There was concomitant pulse irregularity associated with a marked tachycardia. Administering 10 mg. of chlorpromazine per kilogram of body weight, intramuscularly, caused depression after a time lapse of 15 minutes

(experiment 2) and of 30 to 50 minutes (experiment 1), whereas oral administration did not result in depression until after 50 to 60 minutes (experiment 8). All dogs under the effects of chlorpromazine became alert only when handled or excited but would again become depressed when left alone. This behavior made the evaluation of the drug somewhat difficult.

The results for group 1, experiments 1 through 9, are presented in tabular form (table 1).

The effects of chlorpromazine combined with a small dose of pentobarbital were studied in the experiments outlined (table 2). Moderate-to-good potentiation of pentobarbital by chlorpromazine was observed in experiments 11 and 14 but in experiments 10, 12, and 13, surgical anesthesia was not produced. In experiment 12, chlorpromazine given intravenously elicited transient excitement which lasted several minutes prior to depression.

Because the enhancing effects of paren-

†Without a preanesthetic, the average dog requires 28.6 mg. (13 mg./lb.) per kilogram of body weight of pentobarbital sodium to become surgically anesthetized. Each of the 5 dogs in experiment 5, given this dose for control, became deeply anesthetized.

TABLE 3—Oral Administration of Chlorpromazine Hydrochloride to Dogs

Exper. No.	No. of dogs	Dose (mg./kg.)	Time* (min.)	Dose of pentobarbital sodium, i.v. (mg./kg.)	Results
15	6	3	60	19.8	Anesthesia unsatisfactory in 3 dogs;† in 3 dogs, light anesthesia for 60 minutes.
16	5	6	60	19.8	Anesthesia unsatisfactory in 3 dogs;† in 2 dogs light anesthesia for 60 minutes.
17	1	6	90	19.8	Anesthesia unsatisfactory.†
18	1	6	120	19.8	Deep anesthesia for at least 60 minutes.
19	3	10	120	19.8	Anesthesia unsatisfactory in all dogs.†
20	5	20	120	19.8	In 4 dogs deep anesthesia varying from 60 to 180 minutes; in 1 dog anesthesia unsatisfactory.†

\*Between administration of chlorpromazine hydrochloride and pentobarbital sodium.

†Since surgical anesthesia was not produced by these combinations of chlorpromazine and pentobarbital, a full dose of pentobarbital was necessary.



terally administered chlorpromazine on pentobarbital were found to be too transient for most major surgical procedures, experiments with oral administration of chlorpromazine were performed (table 3). In experiment 20, satisfactory surgical anesthesia was produced in 4 of 5 dogs which were given, orally, 20 mg. of chlorpromazine per kilogram of body weight two hours before pentobarbital. In experiments 15, 16, 17, and 19, in which lower doses of chlorpromazine were tested, additional pentobarbital was required before the surgical procedure could be either completed or begun. The dog in experiment 18, however, was deeply anesthetized for about 60 minutes.

#### CONCLUSION AND SUMMARY

In a series of nonsurgical experiments (group 1, table 1), chlorpromazine appeared to have a potentiating effect on pentobarbital. The depressant action of chlorpromazine alone was often transient and was difficult to assess as the dogs were readily roused from the depressive state when handled or excited.

The findings in a series of surgical experiments (group 2, tables 2, 3) indicated that when chlorpromazine was administered orally in the high dose of 20 mg./kg., anesthesia of sufficient depth and duration to facilitate surgical intervention could be achieved by a dose of 19.8 mg. of pentobarbital per kilogram of body weight.

Smaller doses of chlorpromazine administered parenterally or orally did not result in a satisfactory degree of preoperative depression in most cases, and a significant potentiating effect on pentobarbital was not produced.

#### References

- <sup>1</sup>Boulton, T. B.: Oral Chlorpromazine Hydrochloride. A Clinical Trial in Thoracic Surgery. *Anaesthesia*, 10, (1955): 233-246.
- <sup>2</sup>Dundee, J. W.: Uses of Chlorpromazine in Anesthesia and Surgery. *Int. Rec. Med. Gen. Prac. Clin.*, 168, (1955): 340-345.
- <sup>3</sup>Estrada, E.: Clinical Uses of Chlorpromazine in Veterinary Medicine *J.A.V.M.A.*, 128, (1956): 292-294.
- <sup>4</sup>Lehmann, H. E., and Hanrahan, G. E.: Chlorpromazine—New Inhibiting Agent for Psychomotor Excitement and Manic States. *Arch. Neurol. Psychiat.*, 71, (1954): 227-237.
- <sup>5</sup>Schweizer, R.: Orientierende Untersuchungen über Largactilwirkung beim gesunden Hund. *Schweiz. Arch. f. Tierheilk.*, 96, (1954): 143-151.
- <sup>6</sup>Troughton, S. E., Gould, G. N., and Anderson, J. A.: A Report on the Use of Chlorpromazine

Hydrochloride in Domestic Animals. *Vet. Rec.*, 67, (1955): 903-906.

<sup>7</sup>Vandewater, S. L., and Gordon, R. A.: Largactil in Anesthesia. *Canad. Anesth. Soc. J.*, 2, (1955): 23-31.

*Ovine Pregnancy Toxemia.*—Pregnancy toxemia in sheep was considerably reduced in 50 lowland flocks, in England, when weight gain of the ewes was restricted in early pregnancy. Exercise and rations were increased to secure good gains in the last six to eight weeks of pregnancy.—*Vet. Bull.*, July, 1956.

During cesarotomy, in 100 women in Germany, peridural anesthesia was used in 50 with no complications; general anesthesia, used in the others, was followed by asphyxia in a number of infants, four of which died.—*J. Am. M. A.*, Sept. 1, 1956.

*Intrafollicular Ovarian Pregnancy.*—A multiparous woman was found to have a primary intrafollicular ovarian pregnancy, the first such case in 587 patients with ruptured ectopic pregnancy at one hospital in ten years. The 20- by 15-cm. mass, which was suspended on the ligament of the ovary, was removed. The fallopian tube was adherent but distinct from it. The mass contained several cavities, one of which was lined by a smooth shiny membrane. On the floor of this cavity was another mass—the placenta with its membranes, containing amniotic fluid, and a cord to a 10-cm. fetus. The lumen of the tube had been obliterated by chronic salpingitis so the spermatozoa must have transmigrated through the peritoneal cavity to fertilize the ovum.—*J. Am. M. A.*, Sept. 1, 1956.

#### Transfer of Fluorides to a Fetus

Four groups of pregnant women were studied. Twenty were given tablets of calcium fluoride (2.0 mg.) or sodium fluoride (2.2 mg.) daily; 6 drank fluoridated water (1 p.p.m.) throughout pregnancy; and each group had a control group. The fetal blood fluoride, from the umbilical cord, was 250 per cent greater in the group receiving tablets than in their controls, and 175 per cent greater in the groups given fluoridated water than in their controls. The fluoride concentrate in the placentas of the treated groups was also higher than in the controls, but to a lesser extent.—*Science*, Sept. 23, 1955.

## Bone Transplant of Femur in a Dog Using Autogenous Cancellous Bone from the Ilium

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ON SEPT. 30, 1955, a male Terrier, 4 months old, which had been struck by a car was brought to the hospital for treatment.

Palpation and radiographs revealed a simple comminuted fracture of the right femur, with much edema of the part. This fracture was repaired by open reduction and an intramedullary pin. In retrospect, it would have been better to have used a Thomas splint alone.

The soft tissues healed satisfactorily. After three weeks, it was seen by radiograph that the part showed no bridging callous formation. One week later, it was apparent that nonunion had occurred, with much sclerosing of the bone ends (fig. 1). This may have been due to rotation or minor infection of the area.

It was decided to try a bone transplant<sup>1</sup> for the following reasons: (1) to avoid nonunion which often occurs when only freshening the bone is attempted; (2) to restore normal length if possible; and (3) to insure more certain initiation of healing with a graft.

### A REVIEW OF POSSIBLE PROCEDURES

**Cortical Bone Graft.—Inlay Graft.**—The fracture ends are freshened. A rectangular bed is cut into the fractured bone as deep as the medullary cavity, using a special round bone saw.\* A piece of bone of equal size is removed from the healthy tibia and inserted into the prepared bed so that it fits tightly. No screws are needed.

**Sliding Inlay Graft.**—A bed is prepared as above and the graft is cut from either the proximal or the distal fracture segment, depending on which is healthier. This graft is then slid into position so that half is imbedded in each segment.

**Onlay Graft.**—The bed is prepared as in the inlay graft but is not cut as deeply,

i.e., not into the medullary cavity. The graft is the full thickness of cortical bone from which it is taken (usually the tibia). When placed on the prepared bed, its surface protrudes above that of the fractured bone. It is held in position with screws. A double onlay graft, with one such graft on each side of the fracture, may be used for added fixation.

**Cancellous Bone Graft.**—This method will be described in detail in the case report.

It was decided to use a cancellous graft because the onlay or sliding grafts require a special (expensive) bone saw and experience in its operation. Also, the small tibia in this puppy might be weakened if a massive cortical graft were removed. The sliding inlay graft could not have been used because of the already comminuted fracture ends. A cancellous graft was chosen because it is relatively easy to use and is well suited to an area where infection may be



Fig. 1.—Radiograph of femur taken four weeks after fracture repair in a Terrier, showing nonunion and sclerosis of the bone ends.

Dr. Coleman is a general practitioner in Brooklyn, N. Y. The author gratefully acknowledges the assistance of Mr. Norman Cooper during surgery. Mr. Cooper is a premedical student at Columbia University, New York, N.Y.

\*The round bone saw is not required for a cancellous graft. There are two types of this saw, striker and Luk oscillating, available in orthopedic supply houses.

<sup>1</sup>Watson-Jones: Fractures and Joint Injuries, 4th ed. Vol. 1. Williams and Wilkins Co., Baltimore (1955): 298-339.





Fig. 2—Radiograph of femur in a Terrier six weeks after graft (arrow at point of callus).

present. The quick and complete resorption of cancellous bone allows for uninterrupted new bone formation, whereas cortical bone is never completely resorbed when infected and may lead to sequestration, with poor union or nonunion.

Special instruments required for this bone graft include bone-holding forceps, bone shears, bone saw, and bone hammer and chisel ( $\frac{1}{4}$ -inch diameter preferred).

#### OPERATIVE PROCEDURE

Penicillin was administered for two days preoperatively to produce a high blood level at the time of surgery, and asepsis was as complete as possible. Deep anesthesia was produced with sodium pentobarbital and a muscular relaxant (mephenesin).

The femur was exposed by an incision from the trochanter major to a convenient distance below the fracture site. The tensor fasciae latae was split at the borders of the vastus lateralis and biceps femoris. The fracture site was exposed and sponged and all fibrous tissue removed, avoiding injury to the periosteum and soft tissues. The sclerosed bone ends were cut away, with

the bone saw or bone shears, until the hemorrhage and the marrow cavity indicated healthy bone. (The gap left between the bone ends was large enough to give adequate length to the femur but small enough to allow for tight packing of the cancellous bone chips; the gap must not exceed the available supply of chips.)

An intramedullary pin was inserted in the usual manner so that it reached and gripped the distal extremity of the bone (not as shown in the radiographs). A sponge soaked in saline solution was then placed on the wound to protect it.

To obtain the cancellous bone for the graft, a curved incision was made through the skin, following the border of the crest



Fig. 3—Photograph of the femur (2 views) after necropsy, showing the spongy cortex (arrow at site of fracture).

of the ilium and through the middle gluteus muscle at its origin on the crest, freeing its fibrous attachment to the external surface of the ilium. The outer plate of bone was removed from the crest to the origin of the deep gluteus muscle posteriorly. (The deep gluteus muscle may be detached to expose more plate if necessary.) The external plate of bone was removed by gentle hammering on a bone chisel, which was held almost parallel to the plate of bone to dislodge the latter from the underlying thin cancellous bone. The removed plate was discarded and the cancellous bone was removed from the deep plate of the ilium by gentle gouging with the chisel. (Care is necessary since fracture of this plate may lead to herniation.) The middle gluteus muscle was then replaced and sutured with catgut over the iliac crest to the lateral abdominal muscles.

The cancellous bone was placed on a sterile sponge and any adhering cortical

bone was removed. The chips were then packed tightly into the gap between the fractured ends until the entire gap was filled. (It is a good idea at this point to allow some hemorrhage into the area by gentle manipulation of adjacent soft tissues.) The muscles and skin were closed in the usual manner and a Thomas splint applied. Penicillin, 600,000 units, was given intramuscularly daily for a week. The fracture was satisfactorily healed in six weeks. Functional use of the leg was obtained with only a moderate amount of bulging callous formation at the fracture site.

#### DISCUSSION

Authorities<sup>1</sup> state that the greater part of the transplanted bone dies. All bone cells are found to be empty and the trabeculae of bone, whether cortical or cancellous, must be replaced by new bone. However, cells on the surface of the graft survive and the subperiosteal cells, endosteal cells, and cells of the marrow cavity proliferate. Within a few days of the graft, osteoclastic activity is observed on one side of every dead trabeculae, while new bone is laid down by osteoblasts on the other side. The more trabecular the graft, the more quickly it is replaced by living bone.

#### SUMMARY

1) A method for bone grafting has been described for use where nonunion is a problem.

2) This method, using cancellous bone and an intramedullary pin, is accomplished with relative ease and requires no expensive equipment.

3) It is best suited to infected areas and areas where there has been considerable sclerosing of bone. Nearly normal bone length may be obtained, even though much of the fracture segments must be removed.



Fig. 4—Photograph of a sagittal section of the recovered femur in a Terrier (arrow at site of fracture).

*Ram Fertility and Body Temperature.*—During fall breeding, the fertility and embryo survival was significantly higher in rams that were sheared monthly than in those sheared only in April. The rectal temperatures of the recently sheared rams were significantly lower in both years of the test. There was no difference in the fertilizing ability of those fed roughage alone or with grain. The sheared rams, on roughage alone, had the lowest temperatures one year and the best semen quality both years.—*J. Anim. Sci., Aug., 1956.*

## Fertile Bovine Semen After Three Years' Storage

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In the first three months of 1953, a number of bovine semen samples were processed, frozen, and placed in dry-ice storage at this laboratory.<sup>1</sup> From time to time, a small number of ampules containing portions of these samples have been removed

TABLE 1—The Effect of Three Years' Storage of Bovine Semen as Determined by Microscopic Examination

Bull	Length of storage	Evaluation
H-14 (M21)	3 yr. 1 mo.	Fit
H-5 (M26)	3 yr. 1 mo.	Fit
H-27 (M 9)	3 yr. 1 mo.	Not fit
H-14 (J24)	3 yr. 3 mo.	Fit
H-14 (F 7)	3 yr. 2 mo.	Not fit
H-5-1	3 yr.	Fit
H-6-1	3 yr.	Fit
J-1-1	3 yr.	Not fit
H-14 (J-31)	3 yr. 3 mo.	Fit
H-37 (M30)	3 yr. 1 mo.	Fit
B-KING-2	3 yr. 2 mo.	Fit
H-5 (19)	3 yr. 1 mo.	Fit

from storage and used for insemination purposes in order to test the fertility. Some of these trials have been previously reported.<sup>2,3</sup>

The results of inseminations and some observations made of a number of samples taken from several bulls and stored for over three years are presented here.

### PROCEDURE

A microscopic examination was made of the semen from each sample which had

TABLE 2—Conceptions Obtained with Semen Stored Over Three Years.

Bull	Storage time	Breedings	Pregnant*
H-14	3 yr. 3 mo.	8	6
H-5	3 yr. 1 mo.	8	2
H-6	3 yr.	9	1
H-37	3 yr. 1 mo.	10	4
B-KING-2	3 yr. 2 mo.	5	2
Total		40	15

\*Determined by rectal examination.

been stored for over three years. The samples were classified as fit or not fit for inseminating purposes, based on the presence

or absence of vigorous progressive motility. Numbers and the percentage of live spermatozoa were recorded but were not considered in selecting the "fit" samples.

A total of 40 cows was inseminated with the three-year-old semen samples as indicated (table 2). Cows which did not return to service after a 90-day period were examined rectally to confirm pregnancy.

### RESULT AND DISCUSSION

In the microscopic examination of the stored semen samples (table 1), it is of interest that in some cases there was no noticeable loss of viable spermatozoa while, in others, which had been processed in a similar manner and stored side by side, the loss was complete.

Of the 40 cows inseminated, 15 were found pregnant by rectal palpation 90 days after insemination (table 2). As a matter of interest, 2 of the sires used had been dead for over a year at the time of insemination.

### SUMMARY

Frozen semen samples from 5 bulls were found to be fertile after storage for three years in a dry-ice storage chest.

A microscopic examination of some samples showed no noticeable loss of active motile spermatozoa after storage for this length of time. By contrast, other samples showed only small numbers of weakly motile sperm or none at all.

### References

- Macpherson, J. W., and Henderson, J. A.: Low Temperature Preservation of Bull Semen. Proc. Book, AVMA (1953): 413-416.
- Macpherson, J. W.: The Effect of Storage Time on Frozen Bovine Semen. Canad. J. Comp. Med., 18, (1954): 323-325.
- Macpherson, J. W.: Long Term Dry Ice Storage of Bovine Semen, Canad. J. Comp. Med., 19, (1955): 281-289.

*Factors Which Affect Frozen Semen.*—The time that semen remains in a glycerinated extender before being frozen (glycerin equilibration) has a significant effect in the recovery percentage of sperm, but it varies with individual bulls. One-half hour is usually optimal but, with some bulls, an 18-hour period was better. Sperm survival was less after ten days of storage than after two days. Semen once thawed should not be used for insemination beyond the day of thawing. Motility loss is far more rapid after thawing than in unfrozen semen.—J. Dai. Sci., Aug., 1956.

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The cooperation and assistance of the artificial insemination centers at Waterloo and Woodstock, Ont., are appreciated.

## Infectious Embolic Meningo-Encephalitis in Cattle

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INFECTIOUS embolic meningo-encephalitis is an acute or chronic secondary disease of cattle and is characterized by random dissemination of infected emboli in the vessels of the brain and its meninges. Multiple macroscopic and microscopic foci of inflammation and liquefactive necrosis result from the localization of infectious emboli.

### REVIEW OF LITERATURE

Veterinary literature contains few references to infectious embolic meningo-encephalitis. This subject has occasionally been referred to under such headings as meningo-encephalitis, suppurative encephalitis, encephalitis and myelitis, sporadic simple focal encephalitis, and thromboembolic blockage of the vessels of the brain. According to Runnells,<sup>1</sup> "Thrombosis and embolism of the brain in animals appear not to be of as common occurrence as in man."

With regard to the pathogenesis of meningo-encephalitis, Huttyra, Marek, and Manninger<sup>2</sup> state:

Invasion of pathogenic micro-organisms may take place as a result of perforating wounds of the skull or direct extension from neighboring foci of disease, or may occur by way of the blood vessels and nerves. . . . Metastatic invasion, however, is the usual way in which infection occurs, although in connection with pulmonary diseases (particularly tuberculosis) it is possible that bacilli which are coughed up into the pharynx may thence gain access to the brain via the subcranial lymphatic plexuses (Hjortlund). . . .

The possibility of embolism of one of the arteries of the brain is constantly present in cases of chronic valvular diseases of the left side of the heart, and in the very rare cases of thrombosis of the anterior aorta or carotid artery.

Of purulent meningitis it is stated<sup>3</sup>: "It may occur hematogenically in some infectious diseases such as strangles, and in septicopyemias such as those which may be caused by *Corynebacterium pyogenes*, *Pseudomonas aeruginosa*, streptococci, and micrococci." Further, under suppurative encephalitis, he relates:

. . . This form of encephalitis is characterized by the formation of solitary or multiple abscesses. Usually, the pyogenic organisms gain entrance to the brain by way of the blood or lymph stream, i.e., by metastasis from other suppurative processes as in brucellosis of swine, strangles, omphalophlebitis, rhinitis, sinusitis frontalis, and otitis media.

It is also reported<sup>4</sup> that diplococcal infection of the brain and meninges has been demonstrated

in calves, that *Bacillus necrophorus* (*Sphaerophorus necrophorus*) was detected in the brains of 11 per cent of all calves dying of necrobacillosis infections, and that sporadic cases of meningo-encephalitis may occur in cattle at all times of the year and without apparent cause.

This paper is based on necropsy findings and macroscopic and microscopic examinations of brains from 36 cattle affected with infectious embolic meningo-encephalitis. Records in the pathology department, School of Veterinary Medicine, Colorado A. & M. College, reveal that 1 case was reported in each of the years 1949, 1950, and 1951; 7 cases in 1954; 25 in 1955; and only 1 case during the first six months of 1956. Routine necropsies were made of 23 cattle, but only the brains were available from the other 13 animals.

Of the 36 affected animals, 16 were males, 13 females, and the sex of 7 was not recorded.

The age group of 1 to 2 years, the age which predominates in the feedlots, contained the greater number of animals with infectious embolic meningo-encephalitis. The age of 33 affected animals was: under 1 year, 3; 1 to 2 years, 26; 2 to 3 years, 2; and over 3 years, 2.

Since feedlot animals are predominant in the area, 30 cases were in the feedlot cattle and 6 were in pastured animals. Also, since Hereford cattle are predominant in both the feedlots and pastures, the 36 affected animals consisted of 33 Herefords; 1 Aberdeen Angus; 1 Holstein-Friesian; and 1 Shorthorn.

### SYMPTOMS

The clinical symptoms varied to a marked degree. The more constant were blindness, incoordination, depression, convulsions and, occasionally, excitement and irritability. A few animals were comatose and moribund and some were dead when found. The duration of clinical symptoms varied from one day to three weeks. The latter animal was destroyed after being down for three weeks. Temperatures ranged from 99 to 107 F., varying with the stage of infection.

### NECROPSY FINDINGS

Multiple reddish brown foci of necrosis and inflammation were visible on the sur-

From the School of Veterinary Medicine and Agricultural Experiment Station, Colorado A. & M. College, (Griner and Jensen) and Colorado Cattle Feeders Association (Brown), Fort Collins.

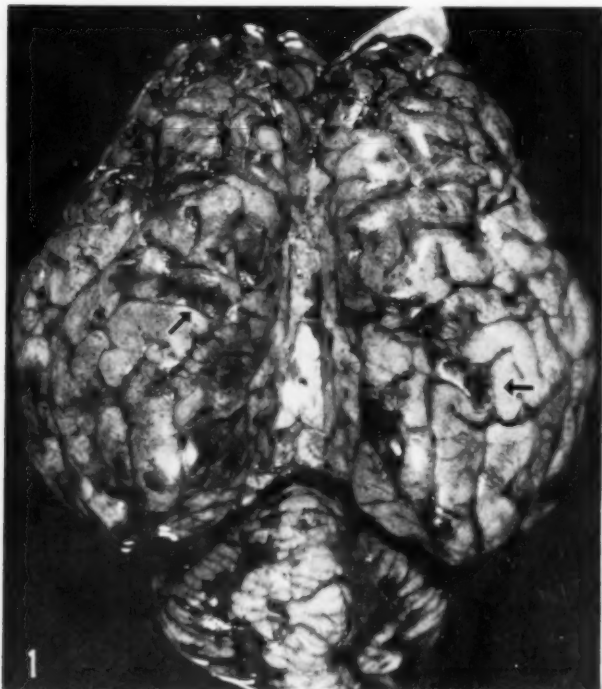


Fig. 1—Bovine brain showing multiple foci of embolic meningo-encephalitis (arrows).  $\times 0.8$ .

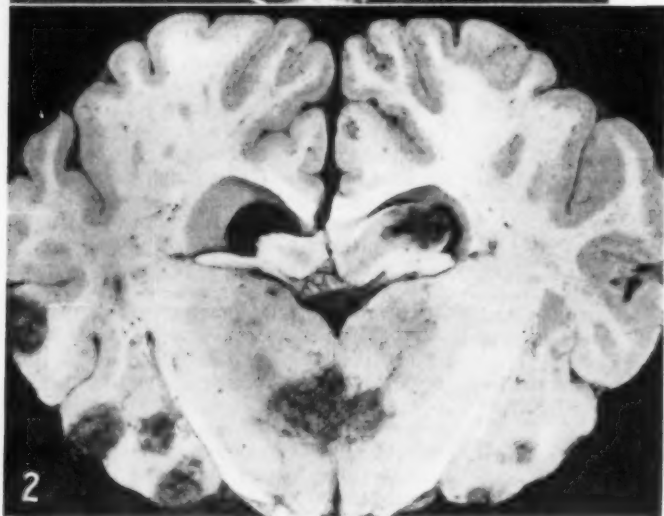


Fig. 2—Transverse section of brain (same as fig. 1) containing large and small foci of infection (dark areas).  $\times 1.0$ .

faces of the brains. Frequently the lesions in the brain were continuous with lesions in the leptomeninges. The meninges occasionally were focally thickened and clouded. In 1 animal, more than 50 gross lesions

were discernible on the surfaces of the brain. Transverse sections approximately 1 cm. in thickness revealed additional lesions, widely distributed, deeper in the organ. In another animal, the pituitary

TABLE 1—Systems, Other than the Central Nervous System, in Which Gross Lesions Were Observed at Necropsy

Case No.	Cardio-vascular system	Lymphatic system	Respiratory system		Digestive system	Urinary system	Skin and externa	Joints and muscles
			Anterior tract	Posterior tract				
49P-223	X		X		X			
50P-903						X	X	
54P-432				X	X		X	
54P-1033	X			X	X	X		
54P-1036			X					X
54P-1090	X		X	X	X	X		
54P-1164		X	X	X	X			
54P-77	X	X			X			
55P-104	X					X	X	
55P-109	X		X	X	X			
55P-137							X	
55P-326			X					
55P-453	X				X	X		
55P-677					X			
55P-808*								
55P-944			X		X			
55P-964	X				X			
55P-966	X	X	X	X	X			
55P-990	X	X	X	X				
55P-999		X						
55P-1152								X

\*Head only was submitted, abscess of pituitary gland.

gland was abscessed and the inflammation extended dorsally into the region of the cerebral peduncles. Gross lesions were observed in all areas of the brain, with cerebral hemispheres more frequently affected. The lesions varied in size from 1 mm. to approximately 2 cm. in diameter. A gross picture of an entire brain and leptomeninges (fig. 1) shows multiple dark foci of inflammation and hemorrhage involving the meninges and brain substance. A transverse section of the same brain (fig. 2) shows multiple foci of inflammation and necrosis. Multiple, well-defined abscesses in the brain from an aged female are also shown (fig. 3).

The distribution of gross lesions in systems other than the central nervous system is shown (table 1) for the 21 animals with infectious embolic meningo-encephalitis in which complete necropsies were performed. In the remaining 15 animals, either the brain only was available or no gross lesions were observed.

Specific pathological lesions in systems other than the central nervous system included: (1) cardiovascular system—sub-epicardial and subendocardial hemorrhages, hydropericardium, pericarditis, myocarditis, myocardial infarcts, and patent foramen ovale; (2) lymphatic system—serous and hemorrhagic lymphadenitis and pete-

Fig. 3—Multiple abscesses in brain of an aged animal.  
x 1.0.





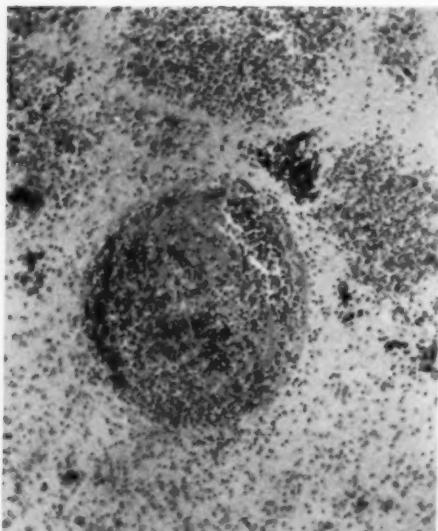


Fig. 4—Section from ventral end of hippocampus showing a well-defined thrombus. Nocht's stain;  $\times 100$ .

chiation of the thymus; (3) respiratory system—petechiation of pleura, fibrinous pleuritis, atelectasis, pulmonary congestion and hemorrhage, bronchopneumonia, pulmonary abscesses, tracheitis, laryngeal hemorrhages, necrotic laryngitis, pharyngitis, rhinitis, and purulent frontal sinusitis; (4) digestive system—erosions of oral mucosa, esophagitis, traumatic reticulitis, abomasal hyperemia, abomasal erosions and ulcerations, hemorrhagic and catarrhal enteritis, colitis, anemic infarcts in liver, and central cirrhosis of liver; (5)

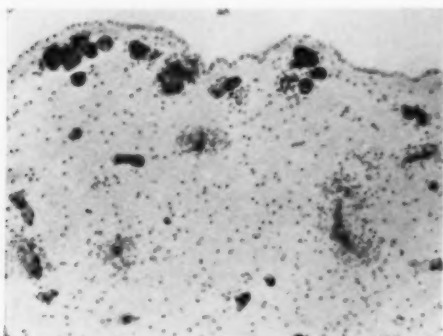


Fig. 5—Section from caudate nucleus (bovine) showing multiple bacterial emboli adjacent to the ependyma of the lateral ventricle. In this case of early infection, the inflammatory reaction is minimal. Nocht's stain;  $\times 80$ .

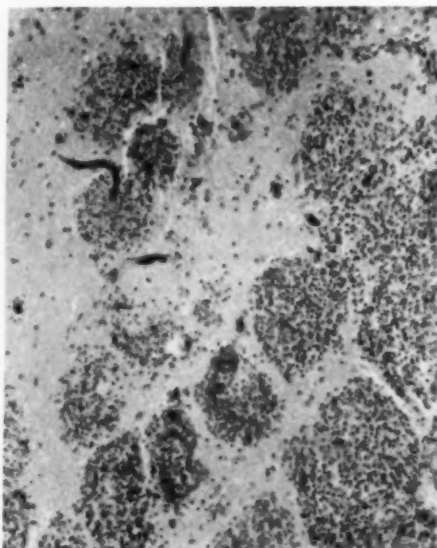


Fig. 6—Section from pons of cow showing bacterial emboli and a more advanced state of infection. Nocht's stain;  $\times 100$ .

urinary system—renal congestion, renal infarcts, and cystitis; (6) skin and externa—stab wound in paralumbar fossa, hypodermiasis, ear ticks, and conjunctivitis; (7) joints and muscles—synovitis; (8) miscellaneous—abscess of pituitary gland.

#### HISTOPATHOLOGY

Lesions of infectious embolic meningo-encephalitis were widely distributed in the gray matter, white matter, and meninges. Brain tissues and meninges contained multiple foci of necrosis and infection. At each focus of infection, the nerve tissue was necrotic and infiltrated with neutrophils, plasma cells, compound granular cells (gitter cells), and lymphocytes. In 26 animals, colonies of bacteria were found in or around affected vessels or were phagocytized by capillary endothelial cells. Gram-positive cocci were the predominating organisms; however, in a few cases, gram-positive bacilli or mixtures of cocci and bacilli were observed (table 2). In one instance, long filamentous gram-negative bacilli mixed with short gram-positive bacilli were abundant in the necrotic foci.

Thrombosed vessels were consistently observed in affected areas. The thrombi were composed of fibrin, leukocytes and, fre-



quently, colonies of bacteria. An area of inflammation usually surrounded the thrombosed vessels. Bacterial emboli and thrombi were abundant in the capillaries. Areas of infection near the external surfaces of the

TABLE 2—Morphological Types of Bacterial Organisms Observed in the Tissues of 26 Animals with Infectious Embolic Meningo-Encephalitis

Morphological type	Frequency of observation
Gram-positive cocci .....	24
Gram-negative cocci .....	1
Gram-positive bacilli .....	12
Gram-negative bacilli .....	1
Mixtures of gram-positive cocci and bacilli ..	10

brain were often continuous with areas of meningitis. Large thrombi were present in some veins and lymphatics of the meninges. Numerous petechial and ecchymotic hemorrhages were found in the focal areas of necrosis and in surrounding viable tissues. At the margins of necrotic areas, both degenerating and viable neurons were present. Nuclei showed pyknosis, chromatolysis, or karyorrhexis, while the cytoplasm presented a homogenous eosinophilia. Lymphocytic perivascular cuffs were numerous in surrounding tissues. In a few animals, the inflammatory foci were minute and were discernible only on microscopic examination. In some tissues, abscesses containing purulent exudate were being formed.

In a few instances, the lesions were of longer duration and histologically presented a chronic inflammatory reaction. Necrotic areas of such cases contained compound granular (gitter) cells in which tissue debris was accumulating. In viable tissues immediately adjacent to the necrotic foci, astrocyte fibrils radiated into both viable and necrotic tissues. Occasionally, evidence of a connective tissue capsule was observed surrounding the zone of necrosis.

#### BACTERIOLOGY

Unfortunately, too few of the affected brains were subjected to bacteriological study. Frequently the brains were contaminated or had undergone autolytic changes. A few brains were fixed in formalin before being submitted to the laboratory. Attempts at culture often produced such a mass of contaminating organisms that the results were believed to be unreliable. *Streptococcus* spp. and *Corynebacterium* spp. were isolated from several specimens and were believed to be reliable cultures.

#### DISCUSSION

Infectious embolic meningo-encephalitis appears to be a secondary involvement resulting from a wide variety of primary disease conditions. As indicated (table 1), lesions were more frequently observed in the digestive, respiratory, and cardiovascular systems. In all probability, a septicemia existed in many of the animals as indicated by infarcts in the kidneys and heart. Some cases of infectious embolic meningo-encephalitis appeared to have been the sequel to infectious rhinotracheitis and bronchopneumonia. It is of interest that valvular endocarditis was not associated with infectious embolic encephalitis in the 36 animals included in this study. Occasionally, no extracerebral lesions were observed at necropsy, which may indicate that the postmortem examinations were incomplete.

#### SUMMARY

1) Infectious embolic meningo-encephalitis was observed in 36 cattle.

2) The disease appeared to be a sequel to a variety of primary infections. Primary lesions were most frequently observed in the digestive and respiratory systems.

3) Infectious rhinotracheitis and bronchopneumonia were the more frequent primary infections.

4) Gram-positive cocci were the most frequently encountered organisms in the tissues examined.

#### References

- <sup>1</sup>Runnels, Russell A.: *Animal Pathology*. 5th ed. Iowa State College Press, Ames (1954): 511-512, 518.
- <sup>2</sup>Hutyrá, Franz, Marek, Joseph, and Manninger, Rudolph: *Special Pathology and Therapeutics on the Diseases of Domestic Animals*. 5th ed. Vol. 3. Alexander Eger, Inc., Chicago (1946): 281, 283, 284.

*Brucella-Infected Mice Resistant to Tuberculosis.*—*Brucella abortus*-injected mice were more resistant to tuberculosis than control mice, and the protection from strain 19 was better than that from a virulent strain. It is believed possible that growth of the tubercle bacillus is inhibited by the phagocytes of the *Brucella*-infected mice.—*Vet. Bull., July, 1956.*

That brucellosis as well as rheumatic fever may be responsible for chronic valvular heart disease in man is suggested.—*J.A.M.A., July 14, 1956.*

# Parenteral Use of Varizyme in the Treatment of Nonresponding Foot Rot in Cattle

## Eight Case Reports

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A CASE OF bovine foot rot which does not respond to therapy is not uncommon. When such cases occur, it has been common practice to amputate the affected portion of the digit. This report will describe a new type of therapy, the parenteral administration of an enzyme preparation, SK-SD-HP\* which has made amputation unnecessary in one practice.

This multiple enzyme preparation, SK-SD-HP, contains streptokinase, streptodornase, and human plasminogen. Streptokinase converts the inactive enzyme, plasminogen, which exists in the euglobulin fraction of plasma, into the active proteolytic enzyme, plasmin. Plasmin is a fibrinolytic enzyme which is capable of dissolving clotted blood and fibrinous exudates. That streptokinase is capable of converting human plasminogen into plasmin, but is incapable of converting bovine plasminogen into bovine plasmin, has been observed. However, the incorporation of human plasminogen with streptokinase gives streptokinase the ability to convert bovine plasminogen into bovine plasmin *in vitro*.<sup>1</sup> Even though it is still to be proved that human plasminogen, or "factor x" (yet unisolated), is necessary to bring about the reaction of plasminogen to plasmin *in vivo* in the bovine animal, its addition to the therapeutic compound guarantees the reaction. Streptodornase causes the depolymerization of desoxyribonucleoprotein and desoxyribonucleic acid, the major constituents of viscous exudates, and thereby, pus is liquefied.<sup>2</sup> In human patients, it has been shown<sup>3</sup> that the basic effect was caused by the streptokinase content of the preparation.† Intramuscular administration in 64 patients with abscesses, cellulitis, edema, epididymitis, glaucoma,

sinusitis, and thrombophlebitis resulted in beneficial response in 60.

Injected parenterally, SK-SD-HP has a hastening effect upon the healing of inflammatory processes. By the dissolution of fibrin, edema and cellulitis are relieved. For many years, it was considered ill-advised to interfere with the natural body defense mechanism; however, with this new type of therapy, it may be possible to bypass the so-called "limiting membrane" which may keep effective therapeutic agents from the causative organism as well as keeping the process localized.

There are several reports on the topical use of streptokinase-streptodornase in small animals.<sup>4-10</sup> Activity of this preparation in these cases could be attributed only to streptodornase, since streptokinase was considered inactive in animals until human plasminogen was added. Therefore, more rapid healing might have been achieved with the newer preparation. This fact, however, is still to be proved.

The successful treatment of deep and nonhealing wounds, edema, cellulitis, osteitis, periostitis, myositis, bursitis, septic arthritis, and an open infected joint in horses by intramuscular injection of SK-SD-HP supported by intramuscular tetracycline‡ therapy has been reported.<sup>11,12</sup>

In this report are presented eight case histories in which SK-SD-HP was used successfully, in conjunction with systemic antibacterial therapy, for the treatment of foot rot which had not responded to routine therapy. The dose administered contained 100,000 units of streptokinase, 25,000 units of streptodornase, and the amount of human plasminogen required to guarantee the activity of the streptokinase. Each patient was again examined three to ten months after treatment.

### CASE REPORTS

**Case 1.**—A 5-year-old, 1,100-lb. Ayrshire cow had been under treatment for foot

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\*Varizyme is the trademark of American Cyanamid Co., for multiple enzyme preparation containing streptokinase, streptodornase, and human plasminogen.

†Varidase is the trademark, the American Cyanamid Co., for streptokinase-streptodornase.

‡Polyotic,® trademark for antibiotic tetracycline, Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.

rot for ten weeks. She had been treated once with sulfamethazine\*\* intravenously, twice with triple sulfonamide-compound tablets orally, and once with a single dose of 2.5 Gm. of tetracycline intravenously, combined with local therapy and soaking of the foot. The foot was badly swollen, walking was difficult, milk production dropped, and the cow was losing flesh.

On the day of presentation, one dose of SK-SD-HP was given intramuscularly. On the third day, slight improvement was noted and amputation was recommended. On the sixth day, the swelling was markedly reduced, a suppurative exudate was oozing from an opening along the coronary band. The cow was using her foot slightly for the first time in two months. A second intramuscular dose of SK-SD-HP and an intravenous dose of 2.5 Gm. of tetracycline were given. Three weeks later, the cow was walking with no limp, the lesion along the coronary band had healed completely and, although there was some deformity of one digit, she was returning to normal flesh and production. Ten months later, the foot had the appearance of "bumblefoot." However, the cow was able to maintain stride, keep up with the herd and was, for all practical purposes, a normal member of the herd.

*Case 2.*—A 6-year-old, 1,400-lb. Holstein-Friesian cow had been suffering from foot rot for one month. Treatment with oral sulfonamides and with 3,000,000 units of penicillin intramuscularly had been unsuccessful. The sole was trimmed and a large caseous and suppurative area was exposed in the right hind heel. Only slight improvement followed local treatment and soaking. The swelling extended up the fetlock area, the cow was severely lame and had a purulent exudate from the sole-heel junction. She was given one dose of SK-SD-HP intramuscularly, 2.5 Gm. of tetracycline intravenously, and soaking of the foot was continued. In four days, there was only a slight reduction in the swelling; however, the purulent exudate was less viscid and the cow was able to put more weight on the foot. A second dose of SK-SD-HP and 1.0 Gm. of tetracycline were given intramuscularly. Three days later the cow stood well on the foot and the material oozing from the sole was more fluid. This treatment was repeated and one week

later the leg appeared normal, the sole apparently had healed, and the cow walked with only a slight limp. Four months later, she had resumed a normal place in the herd but still walked with a slight limp.

*Case 3.*—A 5-year-old, 1,200-lb. Holstein-Friesian cow had been treated locally for foot rot by the owner for one week. The foot was swollen, sore, and two suppurative cracks appeared along the coronary band.

One dose of SK-SD-HP was given intramuscularly and 2.5 Gm. of tetracycline intravenously. After ten days, the foot appeared normal, the cracks healed, and the cow walked normally. After seven months, she was still apparently normal.

*Case 4.*—A 6-year-old, 1,200-lb. Holstein-Friesian cow had been under treatment for foot rot, intermittently, for more than one month. Penicillin, sulfamethazine, surgical debridement with local therapy and saline soaking had all been used with only transient improvement. The right hindfoot was swollen, hot, painful, and a suppurative exudate was oozing along the coronary band.

She was given one dose of SK-SD-HP intramuscularly and 2.5 Gm. of tetracycline intravenously. In two days, the swelling was reduced and the cow was willing to stand on the foot. Six days after treatment, because of a relapse, she was given one dose of SK-SD-HP and triple sulfonamides, to be administered orally for three days, were prescribed. Examination revealed that the foot, even though hot and painful, was less swollen than when first seen and the supuration had stopped. In two days, the swelling was almost gone and soreness was markedly reduced. Tetracycline (1.0 Gm.) was then given intramuscularly. Five days later, the cow was nearly recovered and another 1.0 Gm. of tetracycline was given intramuscularly. After two weeks, a second relapse was reported. The foot was hot, swollen, painful, and held high. Again one dose of SK-SD-HP was administered intramuscularly and 2.5 Gm. of tetracycline was given intravenously. This last treatment was repeated in four days. Two weeks later, even though a slight lameness was still present, the foot appeared normal and no further relapses occurred. After six months, the owner reported that the cow had shown lameness during the last month of gestation but had returned to normal without treatment following calving.

*Case 5.*—A 1½-year-old 600-lb. Jersey

\*\*Sulmet,® trademark for sodium sulfamethazine, American Cyanamid Co., Pearl River, N. Y.

heifer, with foot rot of almost one-month's duration, had been treated with practically all recommended preparations and established surgical procedures.

The foot was largely swollen, painful, and was abscessed. The abscess was opened, one dose of SK-SD-HP was administered intramuscularly and 500 mg. of tetracycline was given intravenously, plus 1.0 Gm. intramuscularly. Intramuscular tetracycline was continued for two days and recovery followed. In about a week, relapse occurred. One dose of SK-SD-HP was given intramuscularly and 2.5 Gm. of tetracycline intravenously, and this was repeated two days later. After five days, the heifer had apparently recovered and no further relapse occurred. Six months later, a painful, localized swelling developed above the heel of the affected digit. The abscess was opened, drained, treated with local antiseptic applications and again returned to an apparently normal condition.

*Case 6.*—A 6-year-old, 1,200-lb. Holstein-Friesian cow had a swollen left hindfoot and pastern with suppuration in the sole. The cow was lame and there was some deformation of the foot. Local sulfonamide and tetracycline therapy was unsuccessful during the 12 days this animal was under treatment.

The cow was given one dose of SK-SD-HP intramuscularly, 2.5 Gm. of tetracycline intravenously, and a sulfonamide pack was applied locally. In four days, she had improved greatly and was given a second dose of SK-SD-HP intramuscularly and 1.0 Gm. of tetracycline, also intramuscularly but in another site. After three weeks, the foot was healed and, although the slight deformity (twisting of 1 digit) was still present, she walked well. Eight months later, the owner reported that a purulent exudate had been observed in the area of the original condition. Since this condition responded to local application of antiseptics by the owner, it was believed that it may not have been associated with the original condition and was probably superficial.

*Case 7.*—A 6-year-old, 1,350-lb. Holstein-Friesian cow was similarly affected. One-half dose of SK-SD-HP and 1.0 Gm. of tetracycline were administered, intramuscularly, three times at intervals of five and eight days. Although she recovered, the response was not as dramatic as it had been in the other animals. She was still lame but was able to resume her place in

the milking line. After four months, this cow was sold because of low production and continued lameness.

*Case 8.*—A 7-year-old, 1,400-lb. Holstein-Friesian cow, first presented in early December, 1955, had an infected area along the medial coronary border of the right claw of the right hindfoot. The area was curetted, dressed with a sulfanilamide pack, and recovery followed. In late December, a relapse occurred and the foot was treated with copper sulfate packs and washes by the owner. On Feb. 13, 1956, the cow was again presented when the affected area was again debrided, and was found to be odorous, and tender.

One dose of SK-SD-HP and 2.0 Gm. of tetracycline were administered intramuscularly at different sites. The cow recovered and after three months she was still apparently normal.

#### CONCLUSION

The response of these cases of nonresponding foot rot to combined SK-SD-HP and antibiotic therapy has been highly gratifying. At least 4 of the animals which recovered were terminal cases and amputation of the digit had been recommended.

Review of the present results, together with those observed in other conditions which we have successfully treated with the enzyme approach, including acute systemic mastitis, acute local mastitis, chronic mastitis, chronic bronchitis, and indolent ulcers, led us to believe that the response might have been more rapid had the material been administered daily for two or three doses rather than at four- to eight-day intervals. A single treatment was found to be occasionally effective. One dose of streptokinase-streptodornase with human plasminogen for two to four days is the present dosage regimen being investigated and recommended by the manufacturer.

In our experience, the safety of intravenous administration of SK-SD-HP, given slowly in saline, in the bovine animal, has been confirmed in more than 20 cases. Even though the use of SK-SD-HP represents the injection of two different sources of foreign protein, no evidence of allergy was observed. Nevertheless, caution should be used with this material.

#### References

- <sup>1</sup>Ablondi, F., and Hagan, J.: Personal communication.

<sup>2</sup>Monograph, Varidase Streptokinase Streptodornase, An Effective Physiological Curette. Lederle Lab. Div., American Cyanamid Co., Pearl River, N.Y., 1955.

<sup>3</sup>Miller, J. M., Surmonte, J. A., Ginsberg, M., and Ablondi, F. B.: Clinical Experience with the Injection of Streptokinase Intramuscularly in the Treatment of Infection and Edema. Maryland State Med. J., 4, (1955): 188-193.

<sup>4</sup>Archibald, J., and Hodgson, J. A.: A Clinical Evaluation of Streptodornase-Streptokinase in the Treatment of Infected Wounds in Small Animals. Canad. J. Comp. Med., 17, (1953): 238-241.

<sup>5</sup>Lieberman, L. L.: Use of Streptokinase-Streptodornase in the Treatment of Canine Otitis Externa. A Case Report. Vet. Med., 48, (1953): 467-468.

<sup>6</sup>McBride, N. L.: Persistent Otorrhea in the Dog. Proc. Book, AVMA (1953): 247-252.

<sup>7</sup>Zontine, W. S.: Streptococcal Enzymes in Treatment of Pathological Processes Complicated by Purulent Exudates. J.A.V.M.A., 125, (1954): 292-294.

<sup>8</sup>Baker, D. L.: Medicinal Therapy in Canine Otitis Externa. Vet. Med., 50, (1955): 313-317.

<sup>9</sup>Parker, S. H.: Clinical Experience with Enzymatic Therapy. North Am. Vet., 36, (1955): 49-50.

<sup>10</sup>Sherry, S., Callaway, D. W., and Freiberg, R.: Prevention of Postoperative Adhesions in the Dog by Intravenous Injections of Plasminogen Activators. Proc. Soc. Exptl. Biol. and Med., 90, (1955): 1-4.

<sup>11</sup>Riley, W. F., Jr.: Light Horse Practice. Vet. Med., 51, (1956): 147-151.

<sup>12</sup>Riley, W. F., Jr.: A Clinical Report on the Intramuscular Use of Varidase Plus Human Plasminogen in Equine Practice. North Am. Vet. In press.

## A Note on the Occurrence of the Nematodes, *Dirofilaria immitis* and *Ancylostoma Braziliense* in Unusual Locations

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For the last several years, practitioners have occasionally reported the occurrence of the heartworm, *Dirofilaria immitis*, in the lungs of dogs. It is common knowledge that many times dogs have microfilariae, presumably of *D. immitis*, in the peripheral blood and, yet when necropsies are done, no adults are present in the heart.

During the last few months, we have had three confirmed reports of adult *D. immitis* in the lungs or pulmonary arteries of dogs.

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In one instance, the adult parasites, 3 females and 2 males, were sent in by a practitioner who reported recovering them from the lungs of a male Shepherd dog, 3 years old, of mixed breeding. The dog coughed up adult filarial worms on March 31, 1956, and died a few minutes later from pulmonary hemorrhage. Previous examinations had revealed no microfilariae in the peripheral blood. At necropsy, many adult filariae were recovered from the lung bronchioles and pulmonary arteries. One adult was found in the aorta. None were in the heart. The worms were identified as *D. immitis*.

The other 2 cases were in dogs presented for necropsy at the School of Veterinary Medicine of the Agricultural and Mechanical College of Texas. An adult female *D. immitis* was recovered from the lungs of a 1-year-old Cocker Spaniel which died April 11, 1956. The worm was deep in the lung and it was difficult to determine if it was in the bronchioles or was released from a pulmonary artery during the examination of the lung. On May 5, 1956, a number of adult filariae, later identified as *D. immitis*, were recovered from the bronchioles of the cardiac lobe of a 4-year-old Fox Terrier. The walls of the bronchioles containing the nematodes were indurated and the adjacent lung tissue inflamed. It is of interest that this dog had died early in the evening and, at the time of necropsy, had been held in the cold room at approximately 38 F. for the preceding 24 hours. One female nematode was still living and contained viable microfilariae.

Another case of a common parasite in an unusual location occurred on May 25, 1956. A practitioner in a city on the Gulf Coast of Texas submitted the posterior portion of the small intestine and most of the large intestine including the cecum from a female Cocker Spaniel, 4 years old. All portions of the intestine, including the large intestine and cecum, contained adult hookworms. It was estimated that at least 500 nematodes were present in the colon and cecum. The majority were attached when the specimen was received. All of the worms that were examined were identified as *Ancylostoma braziliense*. The occurrence of hookworms in the large intestine may not be unique, but this is the first time we have observed this condition.



## Feedings of Small-Flowered Buttercup Not Noticeably Poisonous to a Steer and Sheep

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Three cattle died from unknown causes on a farm about 10 miles north of Leesburg, Va., in April, 1956. It was thought that some poisonous plant, or plants, might be the cause of the deaths. Two plants from the farm, a mustard and a buttercup, were submitted to the U. S. Department of Agriculture for study as the possible source of trouble. The plants were identified at the Plant Industry Station, Beltsville, Md., as *Lepidium draba* and *Ranunculus abortivus*.

Because of numerous references in the literature to different species of buttercups poisoning animals when eaten as green plants, an investigation was made. (The toxic principle of this plant has the reputation of being volatile; buttercups in dry hay are not poisonous.)

On May 7, the writer went to the farm and made a survey for stock-poisoning plants. The only suspected plant found was the small-flowered buttercup (*R. abortivus*).<sup>1,6</sup> It showed evidence of having been grazed.

It was decided to make a test feeding of the suspected plants, which at that time were mostly in the flower stage of growth (there were a few flower buds and a few immature fruits—past-flower stage). Stems, leaves, and flowering parts were collected, taken to the Agricultural Research Center at Beltsville, and were placed under refrigeration.

The next morning, at 8:30, the plants were taken from the refrigerator and the entire collection was ground through a meat chopper. From 9:30 to 11:00 a.m., 4½ lb. of the ground plant material was given *per os*, with a balling gun, to a 122-lb. wether, 3 years old. Because the sheep showed no drooling of saliva<sup>7</sup> or other definite signs of poisoning, another 2 lb. of the same material was given to the same sheep from 3:00 to 3:20 p.m.; the total, in one day, was 6½ lb. (5% of the sheep's weight) of green ground stems, leaves, and flowering parts of small-flowered buttercups. The sheep was observed closely the following day for diarrhea<sup>2,4,7</sup> or any signs

of irritation of the digestive tract but neither was evident.

The leftover ground buttercup was stored in a covered pan in the refrigerator from 4:00 p.m., May 8, until May 10 when it was given with a balling gun, from 8:50 to 9:50 a.m., to a 620-lb. steer calf. The dosage of green plant (9½ lb.) was about 3 per cent of the calf's weight. No signs of poisoning resulted.

From this limited feeding experiment, it would seem that the small-flowered buttercup (*R. abortivus*) at the early May stage of growth, from the vicinity of Virginia or Maryland, would produce no acute poisoning in sheep or cattle. However, the writer's experience indicates that there is a possibility of stock poisoning from even smaller doses of small-flowered buttercup under different conditions. Some of these different conditions may be: in the stage of growth of the plant; in ecological factors under which it grew (soil, climate, etc.); in the physiological condition of the animals; or in the combination of plants or other feed in the digestive tract of the animals concerned. Also, a slight alteration of their structure may change the chemical molecules of the toxic principle so that the plant is comparatively nontoxic. Environment or other conditions may be more conducive to the chemical change at one time than at another. The chemical change theory is illustrated in this quotation from Nicholson:<sup>5</sup>

**Active Principle.**—The ranunculi all contain an acrid juice, the active principle in which was shown by Shearer (1938)<sup>3</sup> to be identical with the protoanemonin isolated by Asahina and Figita (1922) from *Anemone japonica*. Protoanemonin  $C_6H_8O_2$  is a volatile, yellow oil which causes intense irritation to the mucous membranes and blistering when applied to the skin. It is, however, an extremely unstable substance, two molecules readily combining to form anemonin,  $C_{12}H_{16}O_4$ , which rapidly precipitates in long needle-shaped crystals or amorphous flakes when the oil is allowed to stand. Nicholson (1933) showed that anemonin is entirely nonirritant and possesses little or no physiological action, so that there is no doubt that it is the protoanemonin in buttercups which gives them their irritant properties; it is present to the greatest extent at the time of flowering.

### References

<sup>1</sup>Pammel, L. H.: *Ranunculus* (Tourn.) L. Crow-foot Buttercup, in "A Manual of Poisonous Plants." Torch Press, Cedar Rapids, Iowa (1911): 457-460.

<sup>2</sup>Pammel, L. H.: Buttercup or Crow-Foot Poisoning. *Vet. Med.*, 24, (1929): 540-541.

From the Animal Disease and Parasite Research Branch, Agricultural Research Service, U.S.D.A., Beltsville, Md.

<sup>2</sup>Shearer, G. D.: Some Observations on the Poisonous Properties of Buttercups. *Vet. J.*, 94, (1938): 22-32.

<sup>3</sup>Reynard, G. B., and Norton, J. B. S.: Buttercups, Blister Crowfoot, *Ranunculus Sceleratus* L.; Tall Buttercup, *Ranunculus Acris* L.; Small-Flowered Buttercup, *Ranunculus Abortivus* L.; Bulb Buttercup, *Ranunculus Bulbosus* L., in "Poisonous Plants of Maryland in Relation to Livestock." Maryland Agric. Exper. Sta. Tech. Bull. A 10, (1942): 268-269.

<sup>4</sup>Nicholson, J. A.: *Ranunculus*, in "Lander's Veterinary Toxicology." 3rd ed. rev. Baillière, Tindall and Cox, London (1945): 194-199.

<sup>5</sup>Muenschner, W. C.: *Ranunculus*, Buttercup, Crowfoot, in "Poisonous Plants of the United States." Rev. ed. Macmillan Co., New York (1951): 88, 90, 91, 94.

<sup>6</sup>Montgomery, F. H., Henderson, J. A., and Bibbey, R. O.: The Buttercups, in "Plants Poisonous to Livestock in Ontario. Ontario Dept. Agric. Bull. 508, (1955): 17-18.

Equine encephalitis in man, associated with the disease in horses, occurred in several states. In Massachusetts, by September 8, there had been ten human cases, some of them laboratory confirmed, with six deaths. The virus had been recovered from brain tissue of 3 affected horses and deaths had occurred in birds on 12 pheasant farms. There were eight suspected human cases, with one death, in the state of Washington.—*Pub. Health Serv.*, Aug. 23 and Sept. 13, 1956.

*Vibrio Fetus in Man.*—*Vibrio fetus* was isolated, in France, from the blood of four men and one woman with various signs of systemic illness. None had direct contact with farm animals. They responded to chloramphenicol therapy. Some other cases were found in the literature.—*Vet. Bull.*, April, 1956.

*Avian Breed Susceptibility to Salmonella Gallinarum.*—The susceptibility of breeds of chickens to *Salmonella gallinarum* (fowl typhoid) infection varied. When infected at 8 weeks of age, the rate was higher for heavy breeds (80 to 93%) than for light breeds (11 to 36%).—*Poult. Sci.*, May, 1956.

Salmonellosis from eating smoked fish products which served as a vehicle for *Salmonella newport* was reported in 11 adults and four children in Philadelphia in 1955.—*Pub. Health Rep.*, Aug. 1956.

## Fowl Paralysis and Leukosis

Leukosis was recognized in Britain long before fowl paralysis. Fowl paralysis is typically a chronic disease with inflammatory infiltration of the nerves and viscera and a progressive but not neoplastic accumulation of lymphoid cells; there is no blood or bone marrow involvement. The paralysis usually occurs from August to October, indicating an incubation period of five to eight months. It affects younger birds while leukosis usually affects birds in full production. There is no conclusive evidence of the development of leukosis following the transmission of fowl paralysis material or vice versa.—*J. G. Campbell in Vet. Rec.*, Aug. 11, 1956.

*Antibiotic and Egg Production.*—When aureomycin® was fed to chickens at levels of 10 and 100 p.p.m., those on the higher level produced significantly more eggs than the controls (which received no antibiotic) but no significantly more than those on 10 p.p.m.; nor was production of the latter group significantly greater than the controls. During a period when all had a mild respiratory infection, the high level antibiotic feeding was of definite benefit.—*Poult. Sci.*, July, 1956.

*Blood-Clotting Time and Coccidiosis.*—When dicumarol, 1 Gm./lb. of feed, was fed to chicks, 1 day old, it had no effect on their mortality or weight gain. When chicks were inoculated with *Eimeria tenella*, those receiving dicumarol had a higher mortality (75%) than control chicks. When menadione (see vitamin K) was included in the diet (1 Gm./ton), mortality was significantly decreased, the difference being due to the shorter blood-clotting time and reduced cecal hemorrhage.—*Poult. Sci.*, July, 1956.

Histoplasmosis was diagnosed in a family in Virginia shortly after they had cleaned a chicken house. One man was acutely ill.—*Pub. Health Serv.*, Aug. 30, 1956.

*Identify Meat by Precipitin Tests.*—The meat, blood, or blood stains from big game animals were identified, in Colorado, by high titered specific antiserums prepared in fowl with alum-precipitated antigens. Cross reactions which occurred did not prevent identification.—*Vet. Bull.*, Aug., 1956.



## Observations on the Stability of Phenothiazine in Cane Molasses in Relation to Parasite Control

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The use of phenothiazine in low-level concentration with feed is well known for its usefulness to inhibit the development of certain nematode larvae in the feces of cattle.<sup>1-4</sup> The use of phenothiazine with molasses has been questioned because the stability of the drug under this condition has not been known. It was reported<sup>4</sup> that 1 Gm. of phenothiazine to 1 lb. of cane or citrus molasses made a satisfactory mix for low-level intake among cattle in Florida. However, the ingredients were mixed daily because of the unsatisfactory knowledge of the stability of the drug in molasses.

The object of this study was to determine whether phenothiazine would retain its stability in relation to nematode control in cattle after it had been mixed with molasses for a few weeks.

### MATERIALS AND METHODS

The animals used in this study were 8 heifers, weighing 388 to 800 lb., maintained at the University of Hawaii farm. As determined from the roundworm eggs found in the feces, these animals

zine. This was accomplished by mixing, with an electric mixer, 60 Gm. of phenothiazine in 550 cc. of molasses (60 Gm. of phenothiazine displaces about 50 cc. of water). Two batches of the mixture were prepared at different times so that when administered to the animals one mixture was about one month old and the other two months old. The mixture was kept at ordinary room temperature in glass containers loosely covered with a sheet of paper until it was used. It was given *per os* in No. 10 hard gelatin capsules which had a volume of 20 cc.

The animals were used in the experiment for about two weeks. On the first three mornings, fecal samples were collected from the rectum of each animal and a 20-Gm. portion from each sample was cultured by mixing with animal charcoal. Daily, on the fourth to the eleventh mornings, 3 of the 8 heifers (group A) each received one capsule containing 20 cc. of the molasses-phenothiazine mixture which was one month old. Similarly, each of another 3 heifers (group B) received daily one capsule of the mixture which was two months old, and 2 additional heifers (group C) received daily one capsule containing 2 Gm. of phenothiazine without molasses. Group C was used to compare the results with the other two groups. On the eighth, tenth, and twelfth mornings, fecal samples were again collected from all the animals and cultured as before. All the cultures were maintained for six days at room temperature and the larvae were recovered by use of a Baermann apparatus and concentrated in 10 cc. of fluid. Estimation of the recovered larvae was made by the use of dilution counts. No attempt was made to differentiate the various species of larvae.

TABLE 1—Number of Infective Larvae Recovered from 20-Gm. Fecal Samples from Animals Before, During, and After Low-Level Phenothiazine Administration

Heifer No.	Larval count before drug administration			Larval count during drug administration			Larval count after drug administration
	March 12	March 14	March 15	March 19	March 21	March 23	March 30
420 <sup>1</sup>	743	1,140	826	0	0	0	526
426 <sup>1</sup>	1,516	2,660	1,966	0 <sup>1</sup>	0 <sup>1</sup>	0	973
434 <sup>1</sup>	86	93	123	0 <sup>1</sup>	0	3	106
3 <sup>2</sup>	896	393	490	13	3	3	536
419 <sup>2</sup>	336	230	770	0 <sup>1</sup>	0	0	706
429 <sup>2</sup>	286	446	798	0 <sup>1</sup>	0	3	406
10 <sup>3</sup>	56	43	46	3	0 <sup>1</sup>	0 <sup>1</sup>	23
432 <sup>3</sup>	463	246	313	0 <sup>1</sup>	0	0	226

<sup>1</sup>Animal received molasses-phenothiazine mixture one month old. <sup>2</sup>Animal received molasses-phenothiazine mixture two months old. <sup>3</sup>Animal received phenothiazine only. <sup>4</sup>A few larvae were present but not sufficient for dilution count.

harbored a comparatively light-to-medium infection of *Cooperia*, *Haemonchus*, and *Bunostomum*.

The molasses-phenothiazine mixture was prepared so that 20 cc. contained 2 Gm. of phenothia-

### RESULTS

The results of the larval counts from the 20-Gm. fecal samples from each of the three groups of heifers are summarized (table 1). The samples were collected three times preceding drug administration and three times, about a week later, while the drug was being administered. The larval counts among the various animals preceded-

Published with the approval of the director of the Hawaii Agricultural Experiment Station, University of Hawaii, as technical paper No. 377.

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ing drug administration ranged from 43 to 2,660. In similar counts, four to eight days after medication was started, the larvae were reduced to 0 from 13. These findings show that the reduction of larval count among the animals which received the molasses-phenothiazine mixture was similar to that among the animals which received phenothiazine only. This indicates that the stability of the drug in molasses over the period of one and two months remained unaltered. One week after phenothiazine administration was stopped, the number of larvae in the feces was found to have returned to their approximate pretreatment level.

#### SUMMARY AND CONCLUSIONS

Phenothiazine mixed in cane molasses (2 Gm. in 20 cc.) and kept for one and two months, when administered daily in capsules in 20-cc. amounts to 6 heifers, was effective in reducing the number of nematode larvae in the feces of the animals. The reduction of the larval count was similar in 2 heifers which received 2 Gm. of phenothiazine in capsule without molasses. It is concluded that, in relation to parasite control, phenothiazine is stable in cane molasses at least up to a period of two months.

#### References

- 'Mayhew, R. L.: Phenothiazine as a Larvicide Against the Hookworm of Cattle. *J. Parasitol.*, 34, (1948): 14.  
'Mayhew, R. L.: Results of Feeding Small Amounts of Phenothiazine in Pure Infections of the Large Stomach Worm *Haemonchus contortus* in the Calf. *J. Parasitol.*, 38, (1952): 30-31.  
'Cauthen, G. E.: The Effects of Small Amounts of Phenothiazine on the Development of the Ova of the Gastrointestinal Nematode Parasites of Cattle. *J. Parasitol.*, 37, (1951): 14.  
'Dennis, W. R., Swanson, L. E., and Stone, W. M.: Experimental Feeding of Low-Level Phenothiazine to Florida Cattle. *Vet. Med.*, 50, (1955): 379-389, 392.

Antibodies against vesicular stomatitis were found in two of 18 persons in a survey in Georgia. These are the first confirmed cases in man which did not result from exposure in a laboratory.—*Pub. Health Serv.*, Aug. 16, 1956.

Contagious ecthyma, apparently contracted from infected lambs, was diagnosed in two attendants of the flock. Both developed lesions on the hands which did not respond to antibiotics but healed spontaneously after about six weeks.—*Pub. Health Serv.*, July 14, 1956.

#### Poisonous Animal Injuries

Part of the treatment for bites and stings of poisonous animals has been the relief of pain and sedation. However, it has become evident that morphine and meperidine (demerol), as well as most other narcotics, are contraindicated because they increase toxicity of some venoms. Retarding the absorption of the venoms by chilling the site, by application of a tourniquet, or by simple pressure is of benefit. Combinations of these methods are more effective than any alone. Ethylchloride spray has been used until ice could be obtained, but recently dichloro-tetrafluoro-ethane (frigiderm) has been found to be superior. Calcium salt should be injected intravenously if a black widow spider bite is suspected. If this relieves the pain, it should be repeated as indicated.—*J. Am. M. A.*, Sept. 8, 1956.

*Lead Poisoning from Cassettes.*—Serious lead poisoning, manifested by an increase in basophilic granulations of the erythrocytes, occurred in more than half of the personnel of the x-ray service of a military hospital in Belgium. It resulted from handling cassettes contaminated by lead dust from the passage of the cassettes through the lead-lined holders and also from handling other lead equipment. It was suggested that the lead equipment be painted with a durable varnish.—*J. Am. M. A.*, Sept. 1, 1956.

A fatal case of silage gas poisoning in a boy is reported from Iowa. The boy climbed into a silo which had been filled the previous night with grass silage containing some alfalfa.—*Pub. Health Serv.*, Aug. 30, 1956.

*DDT Toxicity Test for Man.*—To test its safety, 14 men voluntarily ate DDT daily for a year, sometimes 200 times the amount that would ordinarily occur on sprayed vegetables. It caused no signs of illness.—*Sci. News Letter*, Jan. 14, 1956.

*Blood Dyscrasia and Sulfisoxazole.*—Thrombocytopenia purpura developed in two persons soon after they had taken 0.5 Gm. of sulfisoxazole four times daily for five and seven days, respectively. Both developed a purpuric rash and one bled from the mouth, nose, and gastrointestinal tract.—*J. Am. M. A.*, Aug. 18, 1956.

# Toxoplasmosis in a Cat

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TOXOPLASMOSIS, a parasitic disease due to *Toxoplasma gondii*, was first reported in rabbits in 1908, in dogs in 1910, and in man in 1923. The parasite may invade any tissue of the body. It is not host specific. Since it occurs in domestic and wild animals and birds, in addition to man, it is a public health problem.

It is only within the past few years that toxoplasmosis has become thoroughly established as a distinct disease entity. In an attempt to aid practitioners who may wish additional information on the subject, a rather extensive review of the literature is presented.

## REVIEW OF LITERATURE

Toxoplasmosis was first proved to exist in North America when it was isolated from a guinea pig in 1937.<sup>1</sup>

The parasites were identified in chicken, duck, and canary erythrocytes in 1941.<sup>2</sup>

Several investigators have discovered the disease in dogs.<sup>1, 2, 4</sup> Both intra- and extracellular parasites were found in the liver and spleen lesions marked by cellular degeneration. Affected dogs were described<sup>4</sup> as manifesting labored breathing, loss of appetite, and a high temperature. The lungs were congested and edematous and contained foci of necrosis. Ulcers in the stomach contained the protozoa.

Another acutely affected dog<sup>4</sup> became progressively emaciated, with persistent diarrhea and heavy breathing. The pathological changes included an exudate in the pleural and abdominal cavities, an enlarged spleen, and ulcers in the intestinal mucosa.

Toxoplasmosis was first reported in a cat in 1942.<sup>5</sup> This spayed female, 1 year old, had no appetite for three days and had a temperature of 103 to 105 F. Serum and sulfonamide therapy were of no value. Necropsy revealed enlarged mesenteric lymph nodes, small ulcers in the intestinal mucosa, and multiple firm, white nodules resembling tumors with central necrosis in the lungs. *Toxoplasma* were demonstrated in the bronchi and the epithelial cells of the lungs.

A case referred to earlier as histoplasmosis in a cat was believed, in 1945, to have been toxoplasmosis.<sup>7</sup>

Encephalitis in a cat, with a disturbance of equilibrium and locomotion, was reported in 1954 to be due to *Toxoplasma*.<sup>8</sup> Also, a case of intestinal toxoplasmosis in a cat was reported in 1955.<sup>9</sup> Both reports give an excellent description of the gross and microscopic pathology.

The disease was reported in chinchillas in 1949.<sup>10</sup> The death rate was high. Affected animals showed labored breathing, loss of equilibrium, and nasal discharge. The carcasses showed hemorrhagic lungs and enlarged spleens and mesenteric lymph nodes. The protozoa were isolated from the lungs, lymph nodes, and brain.

*Toxoplasma* were isolated from diseased swine from 1 day to 1 year of age.<sup>11, 12</sup> Deaths were greater in the younger group of pigs. Necropsy revealed pneumonia, lymphadenitis, ulcerative and fibrinonecrotic colitis, and hepatitis. There was considerable exudate in the pleural and abdominal cavities.

*Toxoplasma* were isolated from infected cattle by injecting the milk intraperitoneally into Swiss mice.<sup>13</sup> A calf, born from an infected cow, harbored the organism in its liver. Calves and 2-year-old heifers, inoculated by various routes, developed the disease. They exhibited symptoms of the respiratory and central nervous systems. In calves, the infection may be acquired *in utero*. The disease in cattle is characterized by coughing, sneezing, rapid breathing, frothing at the mouth, trembling, head shaking, loss of appetite, and prostration just before death.

An affected kangaroo had necrotic foci in the myocardium, the mucosa of the stomach was edematous, and the lungs were speckled with gray-white nodules.<sup>13</sup>

*Toxoplasma* from one species may infect a wide variety of animals. The exact mode of natural infection is not known. The disease has resulted from the ingestion of infected carcasses and this may be an important factor in its transmission in the animal kingdom.<sup>14</sup>

The avian and mammalian forms of toxoplasmosis, while morphologically similar, were not believed to be identical.<sup>15</sup> No cross immunity was observed between the two. Avian toxoplasmosis could not be transmitted experimentally.

Experimentally, the disease was transmitted in canaries by ingestion of infected material, but was not reproduced in other fowl by direct contact.<sup>16</sup>

The parasite was considered, in 1954, as not host specific, as it had been reported in both domestic and wild animals and in birds and man.<sup>17</sup> Definite evidence establishing transmission of infection from pets to owners in the same household had not been reported.

*Toxoplasma* from cases in man, dog, and swine were injected into 5 bitches in various stages of pregnancy.<sup>18</sup> Premature abortions occurred in all 5 animals. The *Toxoplasma* protozoa were isolated from the pups and the fetal membranes and from the milk and mammary glands of the dams.

Cytological study of toxoplasmosis, in 1947,<sup>19</sup> revealed that cells invaded by *Toxoplasma* became

Dr. Smith is with Allied Laboratories, Sioux City, Iowa.

hypertrophied and the nucleus was either destroyed by lysis or, in company with a small amount of cytoplasm, was "pinched off" from the parasitized portion. When the nucleus was lost, it was replaced by a colony of parasites.

The absence of antibodies from serum seemed not to rule out the possibility of toxoplasmic infection.<sup>20</sup>

A definite diagnosis, either in man or animal, must be made by demonstration of the parasite in the body tissues or fluids.<sup>21</sup>

Experimentally infected mice with acute toxoplasmosis recovered clinically when treated with sulfapyridine, but some of the animals may have remained carriers of the disease.<sup>22</sup> The earlier the disease was treated, the earlier was the recovery.

A laboratory worker, infected while doing experimental work with *Toxoplasma*, in 1954, was said to have responded to a combination of triple sulfonamides and an anti-malaria drug, daraprim.<sup>23</sup>

An excellent survey made in 1954<sup>24</sup> suggested that much undiagnosed clinical toxoplasmosis probably exists in animals in the United States.

Veterinarians were advised<sup>25</sup> to exercise caution in handling animals suspected of having toxoplasmosis, and the advisability of allowing pet animals known to be infected with toxoplasmosis to remain in the owner's household was questioned.

#### CASE REPORT

Tissues of a kitten, about 10 months old, consisting of lungs, spleen (fig. 1), and a

kidney were submitted to this laboratory<sup>26</sup> for bacterial examination. Both aerobic and anaerobic cultures were made, but after 48 hours of incubation, there was no bacterial growth.

The kitten had been in the home only seven days when it became ill. It had a temperature of 104 F. with no coughing and no discharge from natural openings. Moist râles could be heard with a stethoscope. The kitten refused food, became dehydrated, and died.

Necropsy revealed many small spherical lesions with central necrosis in the lungs, liver, and spleen and considerable yellowish fluid in the heart sac and in the pleural and peritoneal cavities. The digestive tract was empty but appeared normal.

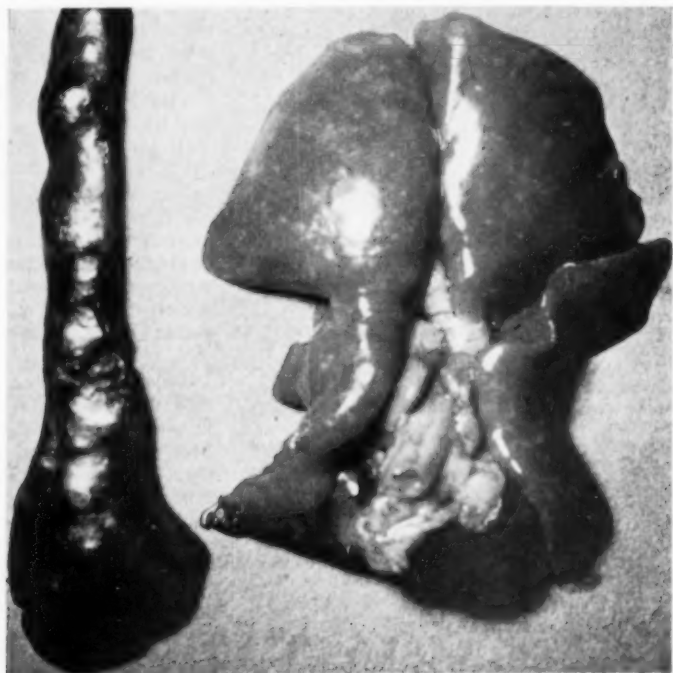
Microscopic sections of the spleen tissues revealed the presence of *Toxoplasma*.

#### COMMENT

A diagnosis of toxoplasmosis is difficult. Almost all warm-blooded animals appear to be susceptible to infection. Any animal that, on necropsy, shows unusual areas of necrosis in the glandular organs with exu-

<sup>26</sup>Submitted by J. O. Buck, Sioux Falls, S. Dak.

Fig. 1—The lungs and spleen of a cat showing numerous small (white) lesions of toxoplasmosis.



dates in the pleural and peritoneal cavities should be examined for Toxoplasma. Since these exudates are usually loaded with the parasites, they make an excellent medium for inoculation into test animals such as mice and guinea pigs.

Proper identification of the protozoa is the only satisfactory means of making an accurate diagnosis of toxoplasmosis.

#### References

- <sup>1</sup>Sabin, A. B., and Olitsky, P. K.: Toxoplasmosis and Obligate Intracellular Parasitism. *Science*, 85, (1937): 336.
- <sup>2</sup>Walfson, Fruma: Mammalian Toxoplasmosis in Erythrocytes of Canaries, Ducks and Duck Embryos. *Am. J. Trop. Med.*, 21, (1941): 653.
- <sup>3</sup>Ray, H. N., and Raghavachari, K.: A Note on Toxoplasma Canis Infection in a Spaniel. *Indian J. Vet. Sci.*, 11, (1941): 29.
- <sup>4</sup>Olafson, Peter and Monlux, W. S.: Toxoplasma in Dogs. *Cornell Vet.*, 32, (1942): 182.
- <sup>5</sup>Moulton, Jack E., and Linton, G. A.: Toxoplasmosis—A Case of Toxoplasmosis in a Dog. *Cornell Vet.*, 43, (July, 1953): 445-451.
- <sup>6</sup>Olafson, Peter, and Monlux, W. S.: Toxoplasma in Dogs. *Cornell Vet.*, 33, (April, 1943): 176.
- <sup>7</sup>Meleny, Henry D.: Toxoplasmosis Mistaken for Histoplasmosis in a Cat. *Am. J. Trop. Med.*, 25, (1945): 163.
- <sup>8</sup>Holzworth, Jean: Encephalitic Toxoplasmosis in a Cat. *J.A.V.M.A.*, 124, (April, 1954): 313-316.
- <sup>9</sup>Lieberman, Leo: Intestinal Toxoplasmosis in a Cat. *North Am Vet.*, 36, (Jan., 1955): 43-45.
- <sup>10</sup>Keagy, Hilan F.: Toxoplasma in the Chinchilla. *J.A.V.M.A.*, 114, (Jan., 1949): 15.
- <sup>11</sup>Farrell, Robert L., Docton, Frank L., Chamberlain, Deane M., and Cole, Clarence R.: Toxoplasmosis Isolated from Swine. *Am. J. Vet. Res.*, 13, (April, 1953): 181.
- <sup>12</sup>Sanger, V. L., Chamberlain, K. W., Chamberlain, D. M., and Cole, C. R.: Isolation of Toxoplasma from Cattle. *J.A.V.M.A.*, 123, (Aug., 1953): 87.
- <sup>13</sup>Hachel, Donald B., Kinney, Thomas D., and Wendt, Wallace: Toxoplasmosis in a Kangaroo. *J. Lab. Invest.*, 2, (March-April, 1953): 154.
- <sup>14</sup>Frenkel, J. K.: Symposium: Toxoplasmosis Diagnosis and Treatment. *J.A.M.M.A.*, 140, (1949): 369.
- <sup>15</sup>Manwell, Reginald D., Coulston, Frederick, Binchley, Ellen C., and Jones, Virginia P.: Mammalian and Avian Toxoplasma. *J. Infect. Dis.*, 76, (Jan.-Feb., 1945): 1-14.
- <sup>16</sup>Manwell, Reginald D., Coulston, Frederick, Binchley, Ellen C., and Jones, Virginia P.: Mammalian and Avian Toxoplasmosis. *J. Infect. Dis.*, 76, (Jan.-Feb., 1945): 1.
- <sup>17</sup>Sanger, V. L.: Toxoplasmosis. Paper presented at Pennsylvania Dept. of Health, Aug., 1954.
- <sup>18</sup>Chamberlain, D. M., Docton, F. L., and Cole, C. R.: Intrauterine Infection in Dogs, Premature Birth and Presence of Organisms in Milk. *Proc. Soc. Exptl. Biol. and Med.*, 82, (1953): 198.
- <sup>19</sup>Cross, Jay Barnes: A Cystologic Study of Toxoplasma with Special Reference to Its Effect on the Hosts Cells. *J. Infect. Dis.*, 80, (May-June, 1947): 278-296.
- <sup>20</sup>Heidelman, J. M.: Evaluation of Toxoplasma Neutralization Tests in Cases of Chorioetinitis. *Arch. Ophth.*, 34, (1945): 28-39.
- <sup>21</sup>Steele, James H.: Toxoplasmosis. *Vet. Med.*, 69, (Nov., 1954): 487-488.
- <sup>22</sup>Weinman, David, and Berne, Robert: Therapeutic Cure of Acute Experimental Toxoplasmosis in Animals. *J.A.M.M.A.*, 124, (1944): 6-8.
- <sup>23</sup>Wettingfeld, R. F., and Rouce, R. H.: Report First Drug Cure of Acute Toxoplasmosis. *Sci. News Week*, (Nov. 20, 1954): 236.
- <sup>24</sup>Cole, Clarence R., Sanger, Vance L., Farrell, Robert L., and Karader, James D.: The Present Status of Toxoplasmosis in Veterinary Medicine. *North Am. Vet.*, 35, (April, 1954): 265-270.
- <sup>25</sup>Lacroix, J. V., Hoskins, H. Preston, and Armistead, W. W.: Toxoplasmosis. *North Am. Vet.*, 35, (April, 1954): 250-252.

*Toxoplasmosis in a Cat.*—Toxoplasma organisms were isolated from the ascitic fluid of a cat which died of the disease in Japan. Peritonitis and granulomatous lesions were found in the pancreas and liver. —*Vet. Bull.*, June, 1956.

*Streptomycin in Cats.*—Pantothenic acid counteracts ototoxic action of streptomycin in cats. It is used either as sodium pantothenate or as one of its streptomycin or dihydrostreptomycin salts. —*J. Am. M. A.*, Aug. 25, 1956.

*Congestive Heart Failure in Dogs.*—Cough and fatigue were the most common signs of congestive heart disease in 24 dogs in Norway; 20 had hyperemia and edema of the lungs. Necropsies on 12 revealed dilatation of both ventricles in 11, and hypertrophy of both ventricles in 7. —*Vet. Bull.*, June, 1956.

Thorotrast, a colloidal solution of thorium dioxide used as a radiopaque agent, is known to be radioactive and has now been shown to be carcinogenic. Authorities have repeatedly warned against its use when a satisfactory alternative agent is available. —*J.A.M.M.A.*, Aug. 18, 1956.

*Palouse—A New Meat-Type Hog.*—A new meat-type inbred hog, all white, with an outstanding record of performance has been developed, at Washington State College, by crossing Danish Landrace boars and Chester White sows. Called the Palouse, it has large litters, gains rapidly and economically, and at a slaughter weight of 210 lb. will have 50 per cent of its weight in the choice meat cuts. Its back fat is usually from 1.3 to 1.6 inches thick. —*Successful Farming*, Sept., 1956.

## What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and accompanying radiographs depicting a diagnostic problem are usually published in each issue of the JOURNAL.

**Make your diagnosis from the picture below—then turn the page ►**



*History.*—A female mixed Terrier, 10 years old, experienced great difficulty in breathing after returning from a three-day absence. There was no evidence of injury, such as might occur from an automobile accident, but a diaphragmatic hernia was suspected. The dog was given 3 oz. of barium solution orally, and a lateral-view radiograph was taken while she was standing.

**(Diagnosis and findings are reported on next page)**



## Here Is the Diagnosis

(Continued from preceding page)

*Diagnosis.*—Hydrothorax (500 cc. of straw-colored fluid was drained from the pleural cavity following the radiographic diagnosis).

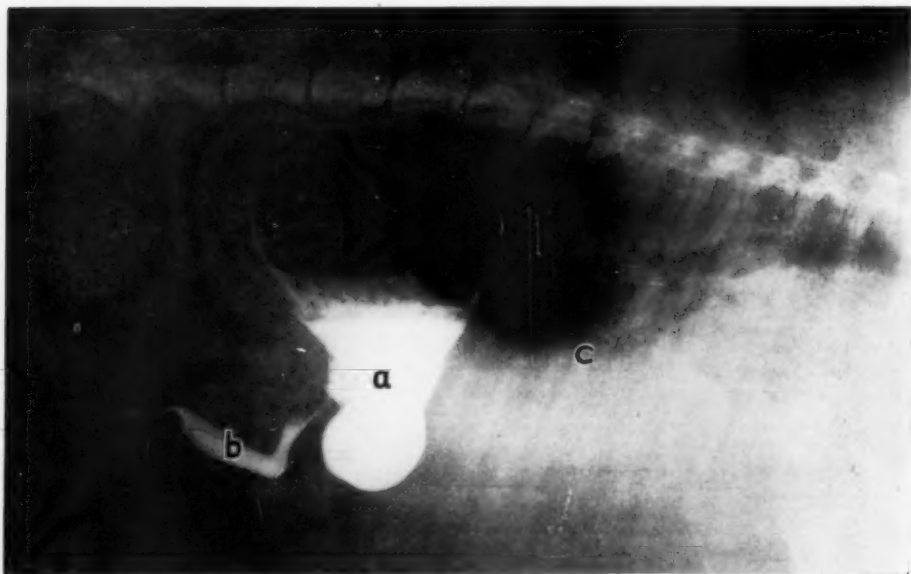


Fig. 2—Radiograph of thorax and anterior abdominal regions, lateral view, of the female mixed Terrier, standing; a—stomach (notice barium level); b—small intestine; c—fluid level in pleural cavity (notice that the lung fields and heart shadows are absent in the lower chest area).

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

This case was submitted by Dr. Julius J. Fishler, Elkhart, Ind.



## Encephalitic Aspergillosis in Turkeys —A Case Report

T. V. RAINES, D.V.M.; C. D. KUZDAS, M.S.;  
F. H. WINKEL, B.S.; B. S. JOHNSON, D.V.M.

Madison, Wisconsin

In birds, pneumomycosis or aspergillosis is not an uncommon malady.<sup>1,2</sup> The spores are ubiquitous in nature,<sup>3</sup> and birds frequently come in contact with them through contaminated feed or litter.<sup>4</sup> *Aspergillus fumigatus* produces a toxin similar to bacterial toxins which causes clonicotonic convulsions, paralytic symptoms and, finally, death.<sup>5</sup> A toxin was obtained<sup>6</sup> which was toxic for rabbits, guinea pigs, mice, and chickens. In this laboratory, we have encountered encephalitic signs in turkeys

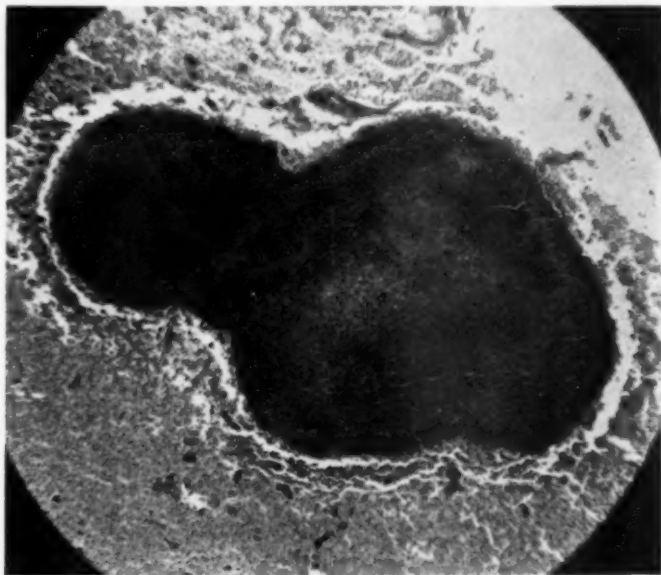
pergillosis which showed macroscopic brain lesions is recorded here.

One dead and 3 live poults were submitted to this laboratory for diagnosis. These 18-day-old birds originated from a flock of 3,500, 10 per cent of which were sick. Losses had been experienced for one week, and a total of 50 birds died. They were on a litter of damp peat moss and sawdust.

Torticollis and a lack of equilibrium were observed in the 3 live poults. The hemagglutination-inhibition tests were negative for Newcastle disease.

On necropsy, yellow, thick, cheeselike deposits and plaque formations were seen on the air sacs, lungs, livers, kidneys, and serous surface of the small intestines. On examination of the brain, yellowish white

Fig. 1.—Brain of turkey showing focal area of necrosis surrounded by chronic inflammatory cells. x 75.



which had extensive aspergillosis lesions in the air sacs and lungs but had no gross changes in the brain. We attributed these encephalitic signs to the *Aspergillus* toxins. A recent experience with encephalitic as-

necrotic foci 1 to 2 mm. in diameter were observed in the cerebrum and the cerebellum.

Scrapings from the cecal mucosa revealed a mild cecal coccidiosis. No bacterial growth resulted from heart and liver cultures on blood agar, eosin methylene blue agar, and tryptose agar plates. Positive isolations of a mold from the cerebrums, cerebellums, and air sacs were made on Sabouraud's medium, tryptose agar, and blood agar plates. The morphology of the

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The authors thank Dr. W. E. Ribelin, University of Wisconsin, Madison, for his counsel on the writing of this manuscript and for the arrangements made by him for obtaining photomicrographs.

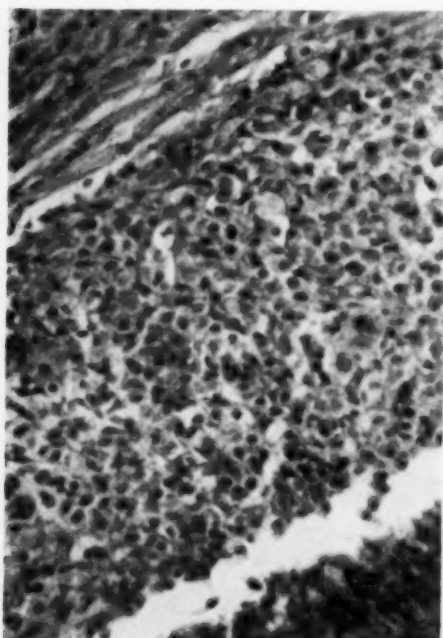


Fig. 2—Brain of turkey showing large mononuclear cells.  $\times 950$ .

mold fitted the description<sup>7</sup> of *A. fumigatus*.

On histological examination of hematoxylin and eosin-stained sections of the cerebrum and cerebellum, large focal areas of necrosis were seen surrounded by chron-

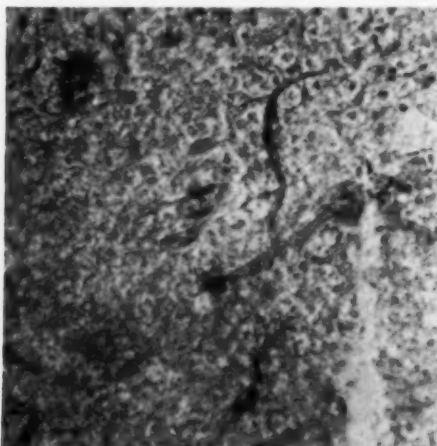


Fig. 3—Brain of turkey showing mycelia of *Aspergillus fumigatus*.  $\times 300$ .

ic inflammatory cells (fig. 1). Many mononuclear cells as well as one isolated focus of giant cells were identified under oil immersion (fig. 2). In the center of some of the granulomatous portions, branching structures resembling mold mycelia were observed.

Gridley-stained sections of the cerebrum and cerebellum revealed many definite pink-staining mycelia against a yellow background in the granulomatous lesions (fig. 3).

#### DISCUSSION

This case shows that encephalitic aspergillosis can occur in very young birds. The pathogenesis of the disease in this case is undetermined. The fungus is known to invade bird eggs during incubation and to infect the embryos.<sup>8</sup> Aspergillosis has not been a problem in other poults which originated from the same hatchery.

#### References

- <sup>1</sup>Kelser, R. A., and Schoening, H. W.: Manual of Veterinary Bacteriology. 5th ed. The Williams and Wilkins Co., Baltimore, 1948.
- <sup>2</sup>Chute, H. L., Witter, J. F., Rountree, J. L., and O'Meara, D. C.: The Pathology of a Fungous Infection Associated with a Caponizing Injury. J.A.V.M.A., 127, (Sept., 1955): 207.
- <sup>3</sup>Conant, N. F., Smith, D. T., Baker, R. D., Calloway, J. L., and Martin, D. S.: Manual of Clinical Mycology. W. B. Saunders Co., Philadelphia, 1954.
- <sup>4</sup>Biemer, H. E., and Schwarte, L. H., editors: Diseases of Poultry. 3rd ed. Iowa State College Press, Ames, 1952.
- <sup>5</sup>Bordin, E., and Gautier, L.: Note sur une toxine produite par l'*Aspergillus Fumigatus*. Ann. Inst. Pasteur, 20, (1906): 209.
- <sup>6</sup>Henrici, A. T.: An Endotoxin from *Aspergillus Fumigatus*. J. Immunol., 36, (1939): 319.
- <sup>7</sup>Thom, C., and Raper, K. B.: A Manual of the Aspergilli. 1st ed. The Williams and Wilkins Co., Baltimore, 1945.
- <sup>8</sup>Henrici, A. T., Skinner, C. E., Emmons, C. W., and Tsuckiya, H. M.: Molds, Yeasts, and Actinomycetes. 2nd ed. J. Wiley and Sons, Inc., New York, 1948.

*Lymphomatosis Virus in Hen Eggs.*—The virus of visceral lymphomatosis was found at a high level in the eggs of normal-appearing, infected hens until they were 18 months old and at a low level when they were 3 years old. A high level of virus was also found in the eggs of their progeny when 9 months old and a low level when 2 years old.—*Poult. Sci.*, July, 1956.

## Canine Digital Hyperkeratosis (Hard Pad Disease – Paradistemper – Hyperkeratosis of Foot Pads)

O. A. LÓPEZ-PACHECO, D.V.M.

*Hato Rey, Puerto Rico*

A CONTAGIOUS febrile disease characterized by a hardening or hyperkeratosis of the volar surface of the digits or foot pads, and occasionally of the nose, is often seen in dogs. Frequently, it is accompanied by leukopenia, gastroenteritis, pneumonia, and neurological disturbances.

Dr. Margaret Scheitlin, a Swiss veterinarian, is said<sup>1</sup> to have first noticed, about 1947, that some dogs ill with distemper occasionally had hyperkeratosis of the foot pads and the nose, and that hyperkeratosis occurred in distemper postvaccination "breaks." The condition was then found to be common.

Veterinarians in Britain and France were confused over the irregular results obtained from canine distemper vaccine and in the treatment of the disease when "vaccination breaks" occurred.<sup>2</sup> They, and others, began to suspect that there was another unrecognized distemper-like infection of dogs. A clinical feature was a preponderance of neurotropic signs which occurred from the beginning, instead of in the later, stages of the disease. Failure to record hyperkeratosis of foot pads in these cases could have been an oversight.

A separate disease characterized by a hyperkeratosis of the foot pads and nose, a rapid course, severe nervous disorders, and a high mortality was suspected about 1948, but the cause of this newly discovered syndrome was not found. Filtrates taken from the dogs afflicted with "hard pad" failed to cause sickness in inoculated ferrets as was the case with the virus of Carré.

The disease has appeared in Switzerland, England, France, Australia, the United States, Puerto Rico, and Ireland. We do not know of any reports of the existence of the disease from Latin America except from Cuba<sup>3,4</sup> and Venezuela.<sup>5</sup>

### CLINICAL OBSERVATIONS

In Puerto Rico, canine digital hyperkeratosis occurs in dogs of all ages, whether or

not they have been previously vaccinated against distemper or infectious canine hepatitis. The degree of hyperkeratosis varies greatly. Affected animals have a temperature of 40 C. (104 F.) and higher for several days; a marked conjunctivitis, with or without discharge; a varying degree of lack of coordination in locomotion characterized by limping, inability to jump or stand on the hindlegs, and soreness of joints; hoarseness, sometimes paralysis of the vocal chords; and digestive disorders with inappetence, occasional vomiting, and diarrhea which sometimes contains blood. Bronchitis or pneumonia with nasal discharge and coughing, and convulsions with champing of the jaws, muscular tic, and even general paralysis, are often observed but the pustules and the "mousy" odor that often accompany distemper are seldom noticed in hard pad disease. Hyperkeratosis of the dorsal nasal region is noticed occasionally.

Vaccination for distemper or hepatitis, regardless of the type of vaccine used or how recently administered, seems to have little, if any, influence upon the incidence, severity, or course of the disease. Dogs that had recovered from distemper, and even those affected with a so-called "distemper tic" and mottled teeth, when examined two or three years later, have shown signs of canine digital hyperkeratosis.

Dogs over 3 years old, if affected, seem to be more resistant and recover quicker than younger ones.

Laboratory examination of blood of affected dogs reveals a leukopenia with a gradual developing leukocytosis.

### TREATMENT

We have arrived at a general form of treatment for canine digital hyperkeratosis. It consists of chloramphenicol (chloromycetin®) with dihydrostreptomycin, in a combination which seems to exert a synergistic, beneficial action. The dosage, one or two capsules each containing 125 mg. of each drug, is given orally every eight hours. Thiamine hydrochloride tablets (100 mg.),

Dr. López-Pacheco is a general practitioner in Hato Rey, P. R.

one every eight hours, together with two rutol® tablets daily are also given.

Vitamin A capsules, 50,000 units daily, given orally, and cortisone acetate, ophthalmic ointment (1.5%), applied three or four times daily, seem to relieve the conjunctivitis.

Special diets such as i/d® or p/d® prescriptions† seem beneficial to the digestive system and to the animal's general nutrition.

Nursing, good sanitation, moderate exercise, tonic of vitamins, and expectorants are indicated. The course of the disease may run from three to eight weeks, but the recovery rate is about 75 per cent when this treatment is followed.

#### CONCLUSIONS

There is still a great difference of opinion as to whether canine digital hyperkeratosis is, or is not, a separate condition from distemper. However, the general clinical pattern of digital hyperkeratosis has some characteristics completely different from those of distemper.

We attribute our high percentage of recoveries in canine digital hyperkeratosis not only to extremely good nursing, but also to patience and to avoiding the performance of euthanasia too early. Many affected dogs considered hopeless have recovered, even though some of them had suffered from severe nervous seizures and encephalitis.

#### References

- \*Riser, Wayne H.: Progress in Understanding Canine Distemper and Associated Ailments. J.A.V.M.A., 116, (1950): 211-214.
- †Goret: Atypical Canine Distemper in Europe. Rev. vét. méd., April, 1948 (abstr. in J.A.V.M.A., 113, (1948): 157.)
- \*Reynaldo, Edilberto, Havana, Cuba: Personal communication, May 27, 1956.
- †Jane, Alberto C., Havana, Cuba: Personal communication, May 27, 1956.
- \*Goldman, Carlos, Caracas, Venezuela: Personal communication, May 23, 1956.

\*Rutol is produced by the Pitman-Moore Co., Indianapolis, Ind.

†The i/d and p/d prescription rations are produced by the Hill Packing Co., Topeka, Kan.

*The Skin of Buffaloes and Cattle.*—The skin of the Egyptian buffalo is thicker than that of cattle; sweat glands per square centimeter of skin averaged 394 compared with 2,633 in cattle, and buffaloes have twice as many sebaceous glands.—*Vet. Bull., June, 1956.*

## Failure of Pasteur Treatment to Protect a Dog Against Rabies

D. A. PRICE, D.V.M., and W. F. JULIFF, D.V.M.

San Angelo, Texas

This case report is recounted in order to provoke thought concerning the handling of canine patients known to have been exposed to rabies.

A mature male Border Collie was presented, along with a Weimaraner puppy, by a woman who had heard a disturbance in the ranch yard two days previously and had, upon investigation, found the 2 dogs fighting with a raccoon. Both dogs and the woman were bitten by the raccoon, which was killed immediately. The state laboratory reported finding Negri bodies in the brain of the raccoon.

We strongly urged euthanasia for both dogs; however, the owner gave permission for the puppy but refused it for the Border Collie due to sentiment and its value as a stock dog. Deciding upon a modified Pasteur treatment, we gave an initial dose of 20 ml. of phenolized rabies vaccine, followed with 13 consecutive daily doses of 10 ml., and arranged for 60 days' confinement in an escape-proof pen.

The sequel to this procedure disappointed us to the extent that we will, henceforth, use more persuasion in advising euthanasia for such dogs.

Ninety-six days after exposure to the rabid raccoon, the Border Collie manifested malaise and restlessness. When examined the next day, the following were observed: temperature, 107.0 F.; hyperpnea; atonic iris and anal sphincter; semicomatose condition; dirt in mouth; and a large unilateral mutilated area on the neck caused by almost constant scratching. He was handled as a rabies suspect and succumbed about 12 hours later.

The state laboratory found no Negri bodies upon microscopic examination of the brain but reported positive results from mouse inoculation. Although the dog at no time attempted to bite, 2 persons had been heavily exposed to saliva just before the dog was returned to the hospital, and they submitted to postexposure treatment.

A search of our office literature revealed two suggestions for the treatment of dogs bitten by known rabid animals. The first<sup>1</sup>

<sup>1</sup>Drs. Price and Juliff are practitioners in San Angelo, Texas.

recommends that large initial doses of phenolized vaccine be given to exposed animals at the earliest possible time; for a 40-lb. dog, 20 ml. of vaccine followed at 24- to 48-hour intervals with two doses of 10 ml. each. The second<sup>2</sup> recommends that dogs and cats bitten by a known rabid animal be destroyed. If the owner refuses, the following alternatives are recommended: (1) The animal should be kept in strict isolation in a kennel for six months. (2) If no previous vaccination had been given within a period of three years with chicken-embryo vaccine, or within one year with nervous tissue vaccine, administer postexposure treatment and confine in a kennel for three months. In a footnote, it is suggested that postexposure treatment may consist of administration of antirabies hyperimmune serum (0.5 ml./kg. of body weight), not later than 72 hours after exposure, followed by a single dose of chicken-embryo vaccine within the next seven days or a course of nervous tissue vaccine. (3) If the animal had been previously vaccinated within one year with nervous tissue vaccine, or within three years with chicken-embryo vaccine, revaccinate and restrain (leashing, confinement) for 30 days.

#### References

<sup>1</sup>Dunlap, G. L., and Lockhart, A.: Treating Rabies-Exposed Animals. *Vet. Med.*, 46, (1951): 225.

<sup>2</sup>World Health Organization Technical Report Series, No. 82, (1954): 15-16. (Distributed in U.S. by Columbia Univ. Press, New York.)

**Antirabic Serum Used Locally.**—Hyperimmune antirabic serum, when given less than 72 hours after a bite by a rabid animal, has been most effective when given subcutaneously or intramuscularly close to the wound. It will neutralize the free virus which may be found in the infected area up to 72 hours. The serum is injected (0.5 cc./kg.) twice daily for two days. In addition, a Semple-type vaccine is given daily for 24 days.—*J.A.M.A.*, Aug. 25, 1956.

A rabid bat was found for the first time in Oklahoma. Rabies was demonstrated by mouse inoculation. Another rabid bat, alive but paralyzed, was found on the University of Minnesota campus. Negri bodies were demonstrated in its brain.—*Pub. Health Serv.*, Aug. 16 and Sept. 13, 1956.

**Rabies in Louisiana.**—Of 183 cases of rabies in northeastern Louisiana during the first half of 1956, 104 were in foxes, 53 in dogs, and 16 in cattle. Wild animals were also affected. The epizootic was brought under control.—*Pub. Health Serv.*, Aug. 9, 1956.

A boy, 3 years old, died of rabies after being bitten on the arm by a rabid dog. Anti-rabies treatment had been started the ninth day and 8 injections given when symptoms appeared. The boy died a week later. This is the third human death from rabies in Texas this year.—*Pub. Health Serv.*, Aug. 2, 1956.

**Persistence of Streptococci in Dry Quarters.**—*Streptococcus agalactiae* persisted through long dry periods in infected quarters. One quarter on each of 7 cows was experimentally infected four to 48 weeks before the end of lactation and organisms of identical strain were immediately recovered after dry periods of 12 to 53 weeks.—*D. G. Howell in Vet. Rec.*, Aug. 11, 1956.

**Stomach Movement Studied with a Magnetic Pill.**—When a tiny magnet coated with plastic is swallowed, its movement, in man, can be recorded externally with a sensitive magnetometer. Of the methods previously used to study stomach movements, the x-ray technique was dangerous and the swallowing of balloons and tubes caused discomfort.—*Sci. News Letter*, Sept. 8, 1956.

#### Tularemia of Man in Sweden

Of 48 patients with tularemia, none was known to have been in contact with rodents. Infection was traced to the sting of a mosquito or other insect in 32; the source was obscure in the other 15. The incubation period in 16 patients with reliable data was one to seven days.

The disease was of the ulceroglandular form in 43, the glandular form in two, the typhoid form in one, and the pulmonary form in one. It was milder than in America, perhaps because it was not conveyed directly by rodents. The agglutination reaction was usually positive within nine to 14 days after the first symptoms. Streptomycin and chlortetracycline therapy were the most satisfactory.—*J. Am. M. A.*, Aug. 11, 1956.



# Nutrition

## Economy of Fancy Livestock Feeds

Grinding grain to medium fine has value, but grinding it to a meal or flour condition increases neither the palatability nor the digestibility, while increasing the cost. Ground hay is not as well utilized as chopped and long hay.

Many preservatives add to the value of silage, particularly grass silage, but adding dry ice for its carbon dioxide and its cooling effect, or adding bacterial cultures, is useless since these items are already present in abundance. Cooking grains for livestock is not economical. Moistening and warming forage may increase its palatability but not its feed efficiency. Sprouting grains to increase their feed value is not economical.—*Univ. of Wisconsin Release*, Aug. 17, 1956.

*Carotenase in the Udder*.—An enzyme, carotenase, capable of forming vitamin A from the B-carotene available in the blood, was found in udder tissue of the cow. It was believed to be concerned with the regulation of vitamin A content of the milk.—*Vet. Bull.*, March, 1956.

*Arsanilic Acid Ineffective for Calves*.—When arsanilic acid was given to calves (50 mg. daily) from birth to 23 weeks of age, there was no significant increase in growth or feed efficiency and no apparent improvement in health or physical appearance.—*J. Dai. Sci.*, July, 1956.

*Estrogen in Fodder Plants*.—Fodder plants, fresh, dried, and as silage, in Germany, were examined for their estrogen content. The highest estrogen content was in forage from farms which had the most fertility disorders.—*Vet. Bull.*, April, 1956.

Steers on pasture, which were given stilbestrol implants of 24 mg. per head, made a daily gain of 0.69 lb. more than controls in one experiment, and 0.58 lb. more in the second experiment.—*J. Anim. Sci.*, Feb., 1956.

*Effect on Pigs of Early Weaning*.—Spring and fall litters (41) of pigs were alternately weaned when 21 or 56 days old, at the University of Kentucky. A pig starter ration was made available for all when they were 3 days old. During the period from 3 to 8 weeks of age, it cost less

to maintain the weaned pigs but the nursing pigs gained nearly 5 lb. more. When all factors were considered, the profit during this period was about the same for both groups.—*Feeds Illus.*, Sept., 1956.

The vitamin A content of the plasma of suckling pigs was found, at the University of Alberta, to be positively correlated with that of their dams.—*J. Anim. Sci.*, May, 1956.

## Proteolytic Enzymes in Milk

The presence in milk of proteolytic enzyme undoubtedly provides the infant with significant digestive assistance in bridging the period of adjustment from prenatal to postnatal nutrition. Attempts to modify cow's milk so that it will be the equal of human milk for infants continues. The latter contains about five times as much proteolytic enzyme as does raw or pasteurized cow's milk. Proteolytic enzymes do not survive in boiled or evaporated milk but part survives pasteurization.

When a commercial pancreatic concentrate is added to whole cow's milk (80 p.p.m.), it acts upon the milk proteins during the heating for pasteurization (143 F. for 30 min.) and about one-third of the enzyme survives. The enzyme content of this milk approximates that in human milk.—*J. Dai. Sci.*, Aug., 1956.

A fat level of 10 per cent of the ration solids can be safely fed to mink during the summer and fall when adequate vitamins and minerals are present. When horsemeat was the main item in the ration, there was a higher fat content than since it has been replaced with fish products.—*Fur News*, Aug., 1956.

*Protein Requirement of a Young Dog*.—A number of growing pups were given a basal ration which contained 10.6 per cent of protein and which sustained health and some growth. Casein was added at various levels for some of the pups. Weight gains corresponded to the protein content when it was 12.8 to 17.2 per cent but not beyond that point.—*J. Nutr.*, March 10, 1956.

Feeding zinc in the form of zinc oxide to chicks at levels of 42 to 820 p.p.m. of the ration had no effect on growth or feed efficiency.—*Poult. Sci.*, July, 1956.



## AVMA Action on Social Security

A number of letters have been directed to the JOURNAL and to the AVMA office by members objecting to the compulsory aspects of the Social Security Act as they now affect self-employed veterinarians.

The following statement from one of the letters is typical of a number received:

This is the beginning toward socialized medicine, and if we can not defend our American and professional rights, we no longer live in a democracy. When the government can force its so-called "insurance program" on an individual it is only a step from setting our professional fees and standard of living.

I belong to the American Veterinary Medical Association so that my rights may be protected and my desires presented before the public and the government—in this case it certainly was not done. Is our AVMA so weak that our opinions and desires can not be considered?

I would like to know the answers to the following questions:

1) Who decided that veterinarians should come under the social security program?

2) Did we get a chance to vote on this issue individually?

3) Why did we become the ONLY group (other professions included) to pay retroactively into social security?

4) Why couldn't participation be on an individual instead of a group level?"

First of all, let's review the record.

The October, 1953, JOURNAL (p. 362) carried the following item on the "News from Washington" page:

H.R. 6812 would extend social security coverage to approximately 10 million additional persons. Veterinarians would be required to participate if they earn \$400 or more a year. This in effect would make it mandatory for self-employed professional persons. The president of the AVMA and some others believe the mandatory requirement, in so far as it affects the self-employed professional person, is objectionable.

Should H.R. 10, an entirely different bill, be enacted as written, the self-employed veterinarian could establish his own voluntary pension plan (see Sept., 1953, JOURNAL, p. 253). The views of the readers of this column would be appreciated relative to the position the AVMA should take with regard to this proposed legislation.

In December, 1953, and January, 1954,

Executive Board members attempted to determine, in so far as possible, the attitude of members as expressed through their constituent associations regarding social security. It was apparent that the majority of AVMA members were opposed to compulsory coverage, but wished to be included on a voluntary basis.

As a result, on April 1, 1954, J. A. McCallam, as president of the AVMA, filed a statement with the Committee on Ways and Means of the House of Representatives, recommending that veterinarians be permitted to participate in the Social Security Act on a voluntary, rather than a compulsory basis (see JOURNAL, June, 1954, p. 488). This item in the JOURNAL also invited members to write for a copy of the complete statement which clearly defined AVMA position on this question.

In May, 1954, telegrams were directed to members of Congress by the AVMA office staff, officers, and by legislative contacts in the various states, urging that veterinarians be permitted to participate on a voluntary basis rather than forced under this program on a compulsory basis. Items were published in 1954 in the JOURNAL concerning this matter (June: p. 488; July: p. 86; Aug.: p. 166; Sept.: p. 257).

As a result, the amendments to the Social Security Act passed by the Eighty-Third congress (Aug., 1954) excluded veterinarians from participation—the Congress pointed out that voluntary coverage was impractical and, since the majority of veterinarians objected to compulsory coverage, they were excluded.

As the Eighty-Fourth Congress got under way in 1955, it was apparent that additional attempts would be made to bring all professional groups under the OASI provision of the Social Security Act. The proposed legislation introduced on July 11, 1955, was H. R. 7225.

### AVMA OPPOSES LEGISLATION

The AVMA House of Representatives in Session on Aug. 13, 1955, in Minneapolis, adopted the following resolution:

WHEREAS, legislation has been introduced in the Eighty-Fourth Congress to amend Title II of the Social Security Act which would extend cover-

age to include self-employed veterinarians; and WHEREAS, this legislation, designated as H.R. 7225, has now been passed by the House of Representatives and referred to the Senate; and

WHEREAS, the Association, through its Executive Board and Board of Governors, has previously expressed opposition to compulsory social security for self-employed veterinarians; therefore, be it

RESOLVED, That this House of Representatives affirm and support the action of the Executive Board in opposing compulsory social security for self-employed veterinarians; and be it

FURTHER RESOLVED, That the Association, through its Washington Representative, legislative contacts, and the central office, work toward the amendment of H.R. 7225 to exclude self-employed veterinarians from the provisions of this legislation when it is considered by the Senate of the United States.

Those who are interested in this story should take time to read the discussion on this resolution as it appears on pages 36-43 in the "Proceedings of the Business Sessions," (Part II, JOURNAL, March 15, 1956).

Following this action by the House, the AVMA representatives testified before appropriate committees of Congress, utilized legislative contacts, and did all that it could to implement and accomplish the intent of the resolution.

A few individual veterinarians and two constituent associations presented testimony to Congress favoring the inclusion of veterinarians under compulsory social security.

In other words, a unanimous expression on behalf of the profession could not be found. This was apparent in all discussions on this matter, whether held at local, state, or national meetings.

As in any democratic society, the majority expression became the Association's policy and as such was freely and forcibly expressed. Those holding minority views were entitled to express their opinions as individuals.

There should be no doubt in the minds of members who read the JOURNAL as to the AVMA opposition to compulsory social security, or to the steps taken to implement

the Association's policy. The fact that the efforts were unsuccessful and veterinarians are under the Social Security Act is due more to the flavor of national politics than it is to a lack of AVMA effort in expressing the desires of its members.

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### The Purpose of Medical Education

The following is an abridged conclusion of an article in the *British Medical Journal* (July 21, 1956: 113):

The development of postgraduate education and, in particular, the compulsory year of hospital practice under supervision before a license is granted to practice have freed the undergraduate course to serve its essential purpose. That purpose is to train the student's mind to collect and assess data and to form a judgment on them. The true aim of the teacher should be to impart an appreciation of method rather than a knowledge of facts, for method is remembered when facts have been forgotten.

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### Selenium Shampoo and Falling Hair

The hair of 6 white women, 18 to 56 years old, began to fall after the use of a selenium sulfide shampoo, which usually had been prescribed for a seborrheic dermatitis. The loss of hair was usually noticed after three to five applications at weekly intervals. Gentle traction would remove the microscopically normal hair. The trouble usually ceased in one to a few weeks after the shampoo was discontinued. The only other adverse symptom was an excessive oiliness of the scalp in several patients. Urinary studies gave no evidence of absorption of selenium.

The article states that this seemed to "fit the pattern of absorption and excretion of selenium observed in lower animals. The parallelism between the symptom of hair loss in livestock suffering from chronic selenium poisoning and the similar symptom in human beings using selenium sulfide shampoo is striking. If this "represents a toxic effect from the absorption of selenium ion through the skin. . . continued use of the preparation might involve serious hazards to the patient."—*J.A.M.A.*, April 21, 1956.

## ABSTRACTS

### A Device to Carry Tissue Through Various Reagents

A simple, inexpensive device, which can be used to carry many tissues simultaneously through various reagents from the fixatives into the paraffin block, is described. Stainless steel tubing (1½-in. in diameter, 14 gauge) was cut into ¾-inch wide rings. Holes, 3/16-inch in diameter, were drilled in the sides at ¼- to ½-inch intervals. A stainless steel screen was soldered onto one end of each ring with ordinary tin lead solder by using a special stainless steel flux. The bottom ring (¼-in. wide) and the first tissue basket were soldered together to form the base for the upright posts which form the retaining wall of the rack. Alternate adjacent posts were joined at the top, leaving two open sides in the walls for easy removal of the tissue baskets from the rack. A spring handle was fashioned by bending a ½-inch stainless steel welding rod one and one-half times around a ¾-inch bolt. The handle fit into the opposite upright posts of the rack holding the lid tightly against the last basket. The lid was a ½-inch ring similarly covered with a screen. A tray, 1- by 1-inch, fashioned out of 14-gauge stainless steel, served as a form for the paraffin block. A movable brass block was made to fit into the tray which, when adjusted, allowed paraffin blocks of different lengths to be poured.—[John G. Boune and R. Getty: *A simple Device for Carrying Multiple Pieces of Tissue Through Reagents from the Fixative into the Paraffin Block*. *J. Am. Vet. Res.*, 17, (July, 1956): 542-554.]

### Chronic Respiratory Disease in Mice and Rats

Except in special cases, the chief organisms causing chronic respiratory disease in mice and rats are ubiquitous and, particularly in rats, pose the most important and most baffling problem in disease control in these animals. It is economically feasible and experimentally desirable to raise rats and mice without these diseases. A description of the disease, and suggested methods of control, are discussed.—[John B. Nelson: *Chronic Respiratory Disease in Mice and Rats*. *Proc. Animal Care Panel* (1955): 9-15.]—N. R. BREWER.

### A New Latin American Veterinary Journal Is Born

*Ciencias Veterinarias*, a Spanish language, bi-monthly journal, issued for the first time in early September (Septiembre-Octubre de 1956), makes available to veterinarians in Latin America veterinary medical information which they would not ordinarily have for two or three years, according to its editor, Dr. Jose Santivanez of Mexico City.

In addition to some original articles, *Ciencias Veterinarias* will reprint articles that have ap-

peared in other recognized veterinary journals. The first issue contains reprints of articles originally published in the *JOURNAL of the AVMA*, *The North American Veterinarian*, the "AVMA Proceedings Book," *Veterinary Medicine*, the *Cornell Veterinarian*, the *New York State Veterinary Journal*, and the *MSC Veterinarian*. News of the Latin American veterinary associations is also published.

The format follows that of most veterinary journals in the United States. Because the paper is of good quality, the illustrations reproduce well. The attractive front cover design signifies the area the journal is intended to serve, with a drawing of Central and South America occupying a large portion of the cover, and North America dwindling away "up north." The first issue contains 124 pages, including eight pages of advertising.

The subscription price is 75 Mexican pesos or \$6 a year. Correspondence should be addressed to: *Ciencias Veterinarias*, Apartado postal 23530, Mexico 10, D.F.

## BOOKS AND REPORTS

### New Gould Medical Dictionary

The second edition of the "New Gould Medical Dictionary" was prepared by an editorial board of 88 specialists in all branches of medical and allied sciences, including two veterinarians.

This edition lists 12,000 new terms, bringing it as up to date as possible in the rapidly growing fields of chest surgery, psychiatry, cancer, arthritis, nuclear science, and others. Although many of the obsolete or infrequently used words were dropped, this dictionary is 169 pages larger than the previous (1949) edition.

The excellent illustrations, many of them in color, are grouped in one central section for convenience, and the tables (on arteries, bones, muscles, nerves, medical signs and symbols, isotopes, and others) appear in the 118-page appendix.

One of the most complete of the medical dictionaries, it is printed on good quality paper in a type that is easy to read.—[*Blakiston's New Gould Medical Dictionary*. Normand L. Hoerr and Arthur Osol, editors. 2nd ed. 1,463 pages. 45 plates. *Blakiston Division, McGraw-Hill Book Co., Inc.*, New York, N. Y. 1956. Price \$11.50.]

### Siamese Cat Book

Written for the novice breeder or owner, this publication tells of the origin and characteristics of the Siamese cat and how to select and care for a new kitten. Further chapters discuss the health and feeding of the cat, breeding, care of the pregnant cat and new kittens, judging standards, showing and grooming, and genetics of the breed. The book is enlivened by several photographs and drawings to illustrate judging points.—[*Siamese Cat Book*. By Vera M. Nelson. 136 pages. *All-Pets Books, Inc.*, Fond du Lac, Wis. 1956. Price not given.]

# THE NEWS

## Dr. Olson Joins Staff at University of Wisconsin

Dr. Carl Olson, Jr., who for the past 11 years has been chairman of the Department of Animal Pathology and Hygiene at the University of Nebraska, Lincoln, accepted an appointment as professor in the Department of Veterinary Science, University of Wisconsin, effective Oct. 15, 1956.



Dr. Carl Olson, Jr.

Dr. Olson was born at Sac City, Iowa, in 1910. He received his D.V.M. at Iowa State College in 1931, his M.S. and Ph.D. both at the University of Minnesota in 1934 and 1935, respectively. He was a fellow in comparative pathology, Mayo Foundation, Rochester, Minn., from 1931 to 1935; an assistant professor of research at Cornell University, Ithaca, N. Y., 1935 to 1937; and research professor of veterinary science, University of Massachusetts, Amherst, from 1937 to 1945. After serving as veterinary laboratory officer in the Veterinary Corps, U. S. Army, from 1942 to 1945,

he accepted the position at the University of Nebraska.

As a result of his extensive research, Dr. Olson has contributed approximately 90 articles on experimental neoplasia in domestic livestock, particularly transmissible tumors of chickens and cutaneous papillomas, and on brucellosis, hematology, listeriosis, bovine hyperkeratosis, and mucosal disease. He is a member of several professional organizations including the Nebraska Veterinary Medical Association, the AVMA, Research Workers in Animal Diseases, Lancaster County Medical Society, American College of Veterinary Pathology, International Academy of Pathology, and American Society of Experimental Pathology. He is chairman of the AVMA committee on Nomenclature of Diseases.

Dr. and Mrs. Olson have four children.

## Dr. Young to Head Department of Animal Pathology at Nebraska

Dr. George A. Young, who came to the University of Nebraska in 1955 as professor of animal hygiene, has been appointed chairman of its Department of Animal Pathology and Hygiene. He succeeds Dr. Carl Olson, Jr., who resigned to become professor of veterinary science at the University of Wisconsin.

A native of Syracuse, Neb., Dr. Young received his B.A. from the University of Nebraska in 1939 and his D.V.M. from Cornell University in 1943. From 1943 to 1946, he was engaged in biological warfare research for the Veterinary Corps, U. S. Army; and from 1946 to 1955 he was with the Hormel Institute of the University of Minnesota as an associate professor.

Among his professional activities, Dr. Young has served as secretary (1954) and chairman (1955) of the Research Section at the respective AVMA conventions and as chairman of the North Central Technical Committee on Losses in Baby

## Veterinary Food Hygienists in Utrecht



Thirty-one countries were represented at the first symposium of the International Association of Veterinary Food Hygienists, held in Utrecht, The Netherlands, August 27 to September 1; 178 members attended. The delegate from the United States was Dr. C. H. Pals and Colonel Wm. E. Jennings was the alternate.

Pigs. He is a member of the Nebraska Veterinary Medical Association, the AVMA, Conference of Research Workers in Animal Diseases and the Society of American Bacteriologists. He has pub-



Dr. George A. Young

lished approximately 40 reports in scientific journals on his research in experimental infection; development of the "disease-free" pig; and viral infections of swine.

Dr. and Mrs. Young have two sons and a daughter.

#### Association of Military Surgeons to Meet in Washington

The Association of Military Surgeons will hold its sixty-third annual convention in the Statler Hotel, Washington, D.C., Nov. 12-14, 1956.

The following speakers will participate in the Veterinary Section: Major Max Nold, V.C., U.S.A.F. (military research in radiation biology); Lt. Col. John T. Stapp, M.C., U.S.A.F. (the veterinarian in aeromedical research); Lt. Col. G. P. Wiedeman, M.C., U.S.A.F. (Air Force Concept of Veterinary Medicine); and Col. Harry A. Gorman, V.C., U.S.A.F. (a new prosthetic hip joint for the dog and its application in man). Interested veterinarians are invited to attend this meeting.

#### Inter-American Veterinary Medical Symposium to Be Held in Puerto Rico

An Inter-American Veterinary Medical Symposium, sponsored by the Asociación Médico Veterinaria de Puerto Rico, will be held Nov. 30-Dec. 2, 1956, at the Caribe Hilton Hotel in San Juan.

The program will include speakers from the United States, Mexico, Cuba, and Puerto Rico, and papers will be translated into English or Spanish, at the time they are presented, by the use of special equipment.

Attendance from all the Latin American

countries and the Caribbean area is expected. Entertainment for the women will be provided. Veterinarians and their wives are cordially invited to attend this symposium.

s/O. A. LOPEZ-PACHECO, *Resident Secretary*.

### AMONG THE STATES AND PROVINCES

#### Colorado

**State Association.**—The annual meeting of the Colorado Veterinary Medical Association was held at the Elkhorn Lodge in Estes Park on Sept. 7-9, 1956.

The following were program participants: Rue Jensen, Colorado A. & M. College, Fort Collins (research); David E. Bartlett, Arlington Heights, Ill. (examination of bulls, artificial insemination); Fred Hartshorn, M.D., Denver (orthopedic surgery); Wade O. Brinker, Michigan State University, East Lansing (small animal medicine, orthopedic surgery); Sam Elmer, Richland Center, Wis. (dairy practice, nutrition); C. K. Mingle and J. L. Hourrigan, ARS, Washington, D.C. (federal veterinarians); Harry Johnson, Littleton (horse practice); and William Lumb, Colorado A. & M. College, Fort Collins (anesthesia). A panel discussion (public relations) was held by Duane T. Albrecht, Murray Camner, and George Miller of Denver; and Homer Brown, Colorado Springs. General practice builders were discussed by Ben Shambaugh, Longmont; Earl Smith, Steamboat Springs; and Lee Eldred, Greeley.

Luncheons, a banquet, and a steak and trout fry were enjoyed by all who attended.

s/GAIL GILBERT, *Secretary*.

#### Florida

**State Association.**—The twenty-seventh annual meeting of the Florida State Veterinary Medical Association was held on Sept. 23-25, 1956, at the San Carlos Hotel in Pensacola.

The program included the following guest speakers and their subjects: B. F. Hoerlein, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn (spinal tap and spinal fluid, spinal conditions, x ray); W. W. Armistead, School of Veterinary Medicine, Texas A. & M. College, College Station (skin autografts, aseptic surgery); David E. Bartlett, American Breeders Service, Chicago, Ill. (examination of a bull, bovine venereal trichomoniasis); Walter L. Newton, National Institutes of Health, Bethesda, Md. (canine filariasis); John P. Fox, M.D., New Orleans, La. (anti-rabies vaccination of man); Len Firth, Canton, Ohio (hospital routine); Frank A. Hayes, School of Veterinary Medicine, University of Georgia, Athens (chinchilla diseases, canine keratoplasty); and James W. Newberne, Pitman-Moore Co., Indianapolis, Ind. (leptospirosis, distemper).



The following members of the Association also addressed the group: Charlie Bild, Miami; A. E. Whaley, Kissimmee; Bill Cunningham, Pinellas Park; Howard and James Acree, Jacksonville; Coy Williams, DeFuniak Springs; D. W. Jensen, Jacksonville; J. E. Anderson, Pensacola; W. S. Bartlett, Pinellas Park; R. P. Bixler, Fort Lauderdale; C. P. Brock, Pensacola; A. R. Chambers, Jacksonville; Ivan Fredrickson, Hollywood; H. C. Hall, Tampa; J. R. Langford, Daytona Beach; Bernard Marks, Jacksonville; Peter Piper, Fort Myers; A. G. Robinson, Crestview; Peter S. Roy, Jacksonville; R. A. Swiezy, Fort Lauderdale; E. F. Thomas, Sarasota; Stanley Wasman, Miami Beach; J. H. Yarborough, Miami; and George Yopp, George Young, and J. P. Young, all of Jacksonville.

A golf tournament, fish fry, banquet, dance, and luncheons were enjoyed by all who attended.

s/ROBERT P. KNOWLES, *Secretary*.

### Illinois

**Northern Association.**—The thirty-sixth annual meeting of the Northern Illinois Veterinary Association was held at the Hotel Faust in Rockford on Sept. 19, 1956, with more than 150 veterinarians from Illinois and Wisconsin in attendance.

The following speakers and their subjects were included in the program: James G. Hardenbergh, Rockton (swine); Richard L. Rudy, Ohio State University, Columbus (small animals); and Vernon Tharp, Ohio State University, Columbus (general practice). A panel discussion, with L. A. Dykstra of Aurora, as moderator, included Joe Albright, Princeton; Charles Larson, Shabbona; Don Rawson, Milledgeville; and William G. Raudabaugh, Piper City.

During the business meeting, the following officers were elected: John M. Nelson, Dekalb, president-elect; E. C. Hannan, Maple Park, president; and James G. Hardenbergh, Rockton, secretary-treasurer. Dr. Don Rawson, Milledgeville, was elected to the executive board.

A cocktail hour and banquet, followed by entertainment, were enjoyed by all who attended.

s/J. M. NELSON, *Secretary*.

### Massachusetts

**State Association.**—At a meeting of the Massachusetts Veterinary Association held on Sept. 19, 1956, at the Shelton Hotel, Springfield, Dr. H. L. Easterbrooks, Lederle Laboratories, Pearl River, N.Y., discussed streptokinase therapy. A dinner and business meeting were also included in the program.

s/C. LAWRENCE BLAKELY, *Secretary*.

### New York

**New York City Association.**—A meeting of the Veterinary Medical Association of New

York City was held Oct. 3, 1956, at the New York Academy of Sciences in New York City.

The speaker, who gave an illustrated talk on practical procedures in canine abdominal surgery, was Dr. James Markowitz, associate professor of physiology, University of Toronto, Ont.

s/C. E. DeCAMP, *Secretary*.

## DEATHS

**Orin C. Bradley** (NAT '92; CVC '01), 88, Fairview, W. Va., died (date unknown). Dr. Bradley was a general practitioner and had been a member of the AVMA.

**\*Lawrence Finney** (MCK '12), 73, Georgetown, Ill., died on Aug. 2, 1956, following a four-year illness. Dr. Finney was employed by the State of Illinois and, for the past 15 years, served as a poultry inspector for the Agricultural Marketing Service, U. S. Department of Agriculture, until he retired in 1954. He was a member of the AVMA and of the Illinois State Veterinary Medical Association. His widow, the former Mary Edna Elkin, two sons, a daughter, and two brothers survive.

**V. V. Martinson** (CVC '18), 59, Milwaukee, Wis., died (date unknown). Dr. Martinson worked in milk sanitation. He had been a member of the AVMA.

**Gustav P. Mayer** (CVC '16), 72, East Lansing, Mich., died July 28, 1956, of a heart ailment. Dr. Mayer, a pioneer in the field of bovine tuberculosis eradication, had been with the state agriculture department for 30 years, until his retirement in 1954. He had been a member of the AVMA. Surviving are his widow, a daughter, and a sister.

**Adrian J. Mitchell** (CVC '09), 73, Erie, Pa., died on July 23, 1956, of a heart attack. Dr. Mitchell had practiced in Erie for 40 years. Surviving are his widow, a daughter, and a granddaughter.

**\*John P. Simons** (CIN '10), 77, Ottumwa, Iowa, died Sept. 3, 1956, following an extended illness. Dr. Simons served with the BAI, U.S.D.A., until his retirement. He was a member of the East Central Iowa, the Eastern Iowa, and Iowa State Veterinary Medical Associations and was made a life member of the AVMA in 1952. He is survived by a daughter and a brother.

**\*E. V. Wilcox**, Washington, D. C., died (date unknown). Dr. Wilcox was made an honorary member of the AVMA in 1904.

**Frank B. Wilson** (COL '15), 63, Guthrie Center, Iowa, died in August or September, 1956. Dr. Wilson had practiced in Guthrie Center for 33 years. He was a member of the Iowa Veterinary Medical Association and had been a member of the AVMA. His widow and a brother survive.

★Indicates members of the AVMA.



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## ORGANIZATION SECTION

### WOMEN'S AUXILIARY

Acting President—Mrs. Alfred E. Coombs, P.O. Box 174, Skowhegan, Maine

Secretary—Mrs. F. R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind.

**Canadian Auxiliary.**—The annual meeting of the Women's Auxiliary to the Canadian Veterinary Medical Association was held at the Sheraton-Mount Royal Hotel, Montreal, on July 19-21, 1956, in conjunction with the eighth annual meeting of the Canadian Veterinary Medical Association.

Social activities, planned for men and women together, included a visit to St. Helen's Island and dinner at the H  lene de Champlain restaurant, hosted by the mayor of Montreal. The island, converted into a civic park and picnic ground, overlooks part of the St. Lawrence Seaway development.

The business meeting was opened with greetings from Mrs. Alfred E. Coombs, Skowhegan, Maine, acting president of the Women's Auxiliary to the AVMA, followed by reports from the provincial auxiliaries and from Mrs. E. L. Brown, Canadian representative to the International Women's Auxiliary to the Veterinary Profession. It was decided to donate \$10 toward the expenses of mailing the *International Newsletter*, and to vote a sum of money at each annual meeting to help defray traveling expenses of the president and secretary. The sum voted this year was \$100 for each.

s/EILEEN KEALEY, Retiring Secretary.

• • •  
**Florida Auxiliary.**—The ninth annual meeting of the Women's Auxiliary to the Florida State Veterinary Medical Association was held on Sept. 23-25, 1956, at the San Carlos Hotel, Pensacola, in conjunction with the twenty-seventh meeting of the Florida State Veterinary Medical Association.

The program included a guided tour of the Naval Air Station and a visit aboard the aircraft carrier Saipan, a tour around Pensacola, a luncheon, and a business meeting.

s/MRS. PAUL MYERS, Secretary.

• • •  
**Northern Illinois Auxiliary.**—The fall meeting of the Women's Auxiliary to the Northern Illinois Veterinary Medical Association was held at the Hotel Faust, Rockford, Sept. 19, 1956, in conjunction with the thirty-sixth annual meeting of the Northern Illinois Veterinary Medical Association. The following officers were elected for the ensuing year: Mrs. E. C. Hannan, Maple Park, president; Mrs. J. M. Nelson, DeKalb, vice-president; and Mrs. James G. Hardenbergh, Rockton, secretary-treasurer.

The social activities included a luncheon, cocktail hour, and a banquet.

s/MRS. J. M. NELSON, President.

### APPLICATIONS

#### Applicants—Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative Bylaws.

#### BRAVO, GABRIEL FERNANDEZ

Concejal Veiga No. 116, Santos Suarez, Habana, Cuba.  
D.V.M., University of Habana, 1949.

#### LEBLANC, JOSEPH E.

Paincourtville, La.  
D.V.M., Kansas City Veterinary College, 1917.

#### SCHNEIDER, HENRY P.

1115 W. Erie Ave., Philadelphia, Pa.  
V.M.D., University of Pennsylvania, 1934.

#### Applicants—Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorser.

#### Second Listing

BARNES, JACK M., 7112 Wayne Ave., Kansas City, Mo.

LEE, CHANG HI, Anyang, National Institute for Veterinary Research, Anyang Kyongki-Do, Korea.

PLOCHER, PHILIP D., Det. 2, Zone 1, 2nd AA Vet SU, Salisbury, Md.

TERRY, JOHN L., JR., 2028 Cascade, Richland, Wash.

#### Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student

(Continued on p. 26)

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Quick relief for Bone,  
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24 and 4 free . . . . . 28.00

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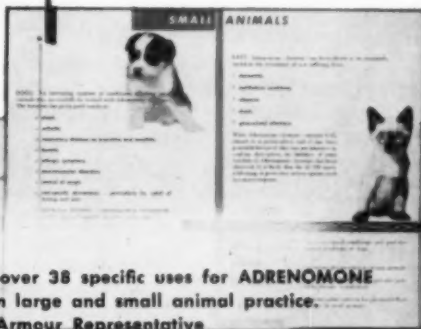
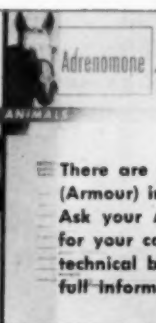
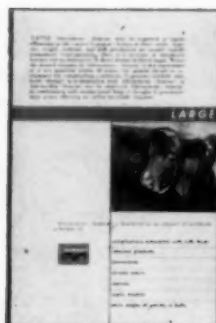
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## ORGANIZATION SECTION

(APPLICATIONS—continued from p. 24)

chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (\*) after the name of a school indicates that all of this year's graduates have made application for membership.

### First Listing

#### Colorado A. & M. College

OLSEN, DONALD B., D.V.M.

93 W. 2nd North, Smithfield, Utah.

Vouchers: W. V. Lumb and W. H. Beckenhauer.

#### Michigan State University

HARRIS, ROBERT E., D.V.M.

939 Main St., Crete, Ill.

Vouchers: G. R. Moore and C. C. Morrill.

PLYMALE, HARRY H., D.V.M.

11838 Allard St., Norwalk, Calif.

Vouchers: N. R. Cholvin and S. C. Schmittle.

#### University of Missouri

PRICE, BILL A., D.V.M.

198 E. Chicago, Marline, Mo.

Vouchers: J. T. McGinity and J. E. DeWeese.

#### University of Pennsylvania

MALLINSON, EDWARD T., V.M.D.

c/o Dr. T. W. Brown, Fawn Grove, Pa.

Vouchers: T. W. Brown and L. J. Wolfe.

WAMPLER, DONALD, V.M.D.

121 Ridge Rd., Moses Lake, Wash.

Vouchers: J. H. Mark and W. Boucher.

#### Texas A. & M. College

PAYNE, BOBBY J., D.V.M.

Rt. 4, Box 39, West Monroe, La.

Vouchers: H. L. Foust and W. W. Armistead.

### Second Listing

#### University of California

CARMICHAEL, LELAND E., D.V.M., 732 Fairview Ave.,

Arcadia, Calif.

#### Michigan State University

McCLUMPHA, CLIFFORD, D.V.M., 831 E. Main St.,

Owosso, Mich.

#### University of Minnesota

GRAVES, IRVING L., D.V.M., South Dakota State Col-

lege, Department of Veterinary Science, College Station,

S. Dak.

SWANSON, RAYMOND B., D.V.M., 2290 Brewster St.,

St. Paul, Minn.

#### University of Pennsylvania

FOURNIER, LORRAINE A., V.M.D., 1201 University

Ave., New York, N. Y.

#### Texas A. & M. College

BROCK, RALPH H., D.V.M., 700 N. Main, Bryan, Texas.

MASSIE, WINFIELD, D.V.M., Rt. 1, Midlothian, Va.



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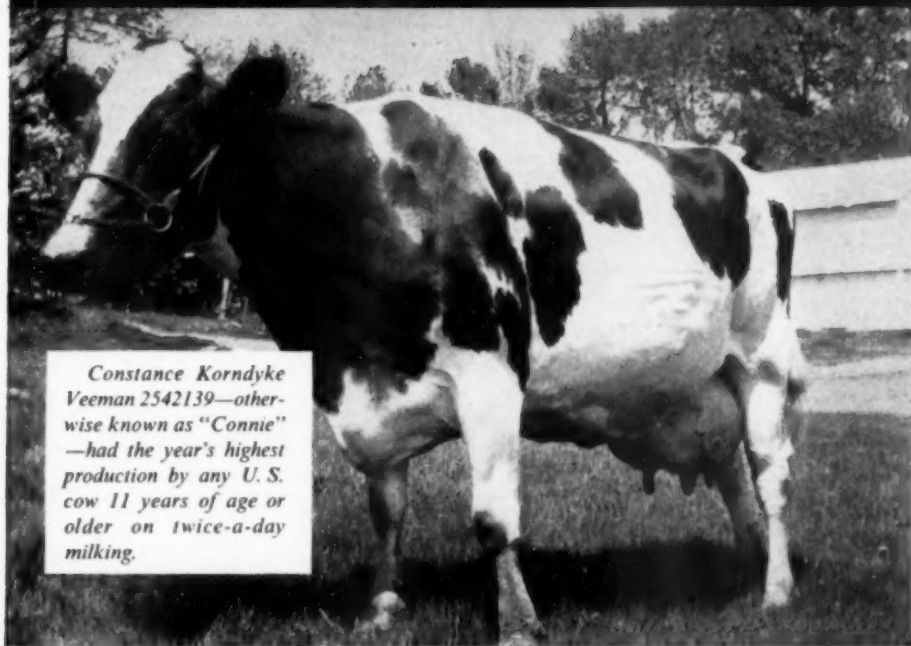
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## American Veterinary Medical Association

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Not only highest producing U. S. cow for her age, "Connie" also won honors as all-time high producing Iowa dairy cow, 2nd highest cow in

the nation for milk production on twice-a-day milking, and 4th highest in the nation for butterfat production on twice-a-day milking.

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## COMING MEETINGS

Mississippi Valley Veterinary Medical Association. Annual meeting. Hotel Pere Marquette, Peoria, Ill., Nov. 7-8, 1956. William L. Beer, 612 N. College Ave., Alledo, Ill., secretary.

American Public Health Association. Annual meeting.  
Convention Hall, Atlantic City, N. J., Nov. 12-16, 1956.  
Reginald M. Atwater, 1790 Broadway, New York 19,  
N. Y., executive secretary.

Midwest Small Animal Association, annual meeting, and American Animal Hospital Association, regional meeting. Hotel Burlington, Burlington, Iowa, Nov. 18-19, 1956. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield Ill., secretary, Midwest Small Animal Association.

U. S. Livestock Sanitary Association. Annual meeting. Morrison Hotel, Chicago, Ill., Nov. 28-30, 1956. R. A. Hendershott, 33 Oak Lane, Trenton N. J., secretary.

Animal Care Panel. Annual meeting. Morrison Hotel, Chicago, Ill., Nov. 29-30, 1956. Robert J. Flynn, P.O. Box 299, Lemont, Ill., secretary.

Nebraska Veterinary Medical Association. Annual meeting.  
Hotel Lincoln, Lincoln, Dec. 3-5, 1956. W. T. Spencer,  
1250 North 37th St., Lincoln, secretary.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, Jan. 2-4, 1957, W. A. Hagan, dean.

Pennsylvania, University of. Annual conference for veterinarians. School of Veterinary Medicine, 39th St. and Woodland Ave., Philadelphia, Pa., Jan. 8-9, 1957. M. W. Allam, dean.

Tennessee Veterinary Medical Association. Annual meeting. Memphis, Tenn., Jan. 13-15, 1957. H. W. Hayes, 5009 Clinton Pike, Knoxville, secretary.

Oklahoma Veterinary Medical Association, Annual meeting.  
Huckins Hotel, Oklahoma City, Jan. 14-15, 1957. M. N.

Riemenschneider, 122 State Capitol Building, Oklahoma City, secretary.

Iowa Veterinary Medical Association. Annual meeting.  
Hotel Fort Des Moines, Iowa, Jan. 22-24, 1957. F. B.  
Young, Waukegan, Iowa, secretary.

Virginia Veterinary Medical Association. Annual meeting.  
Hotel John Marshall, Richmond, Va., Jan. 27-29, 1957.  
W. B. Bell, 1303 Hillcrest Dr., Blacksburg, secretary.

California State Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Jan. 28-30, 1957. Charles S. Travers, 3004 16th St., San Francisco, executive secretary.

Louisiana State University. Annual conference for veterinarians. Pleasant Hall, Louisiana State University, Baton Rouge, Jan. 29-30, 1956. W. T. Oglesby, Department of Veterinary Science.

Minnesota State Veterinary Medical Association. Annual meeting. Radisson Hotel, Minneapolis, Feb. 4-6, 1957. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, secretary.

New Jersey, Veterinary Medical Association of. Annual meeting. Berkeley Carteret Hotel, Asbury Park, Feb. 13-14, 1957. J. R. Porteus, P. O. Box 938, Trenton 5, N. J., resident secretary.

Illinois State Veterinary Medical Association. Annual meeting. LaSalle Hotel, Chicago, Feb. 26-27, 1957. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, Ill., secretary.

## Foreign Meetings

Asociación Médico Veterinaria de Puerto Rico. Inter American veterinary medical symposium. Caribe Hilton Hotel, San Juan, Nov. 30-Dec. 2, 1956. O. A. López-Pancheco, P.O. Box 155, Hato Rey, Puerto Rico, chairman.

(Continued on p. 30)



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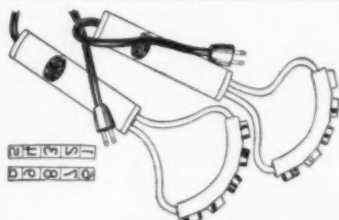
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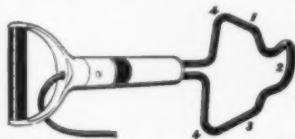


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## Regularly Scheduled Meetings

**ALABAMA**—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

**ARIZONA**—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Pima County Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

**CALIFORNIA**—Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

Association of East Bay Veterinarians, bimonthly, the fourth Wednesday. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rocky, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1791 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Facobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King Visalia, Calif., secretary.

(Continued on p. 34)

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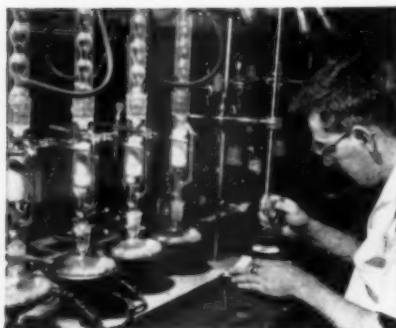
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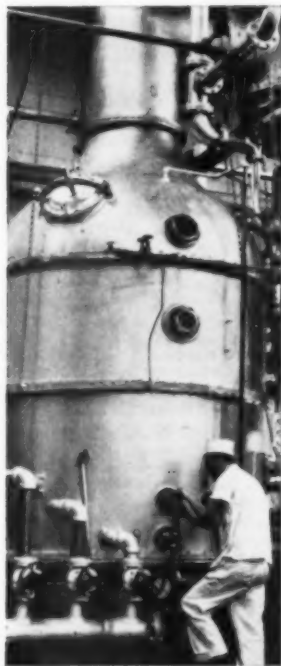
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**COLORADO**—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5066 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

**DELAWARE**—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

**FLORIDA**—Central Florida Veterinary Medical Association, the second Friday of each month, time and place specified monthly. James B. Murphy, Eustis, Fla., secretary.

Jacksonville Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. George F. Yopp, 4644 Main St., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. Harold A. Tennant, Atmore, Ala., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. Ross E. Evans, 5215 S. Dixie Highway, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

Suwannee Valley Veterinary Association, the third Friday of each month, at the Thomas Hotel, Gainesville, Fla. R. C. Mann, Rt. 1, Box 37, Ocala, Fla., secretary.

**GEORGIA**—Atlanta Veterinary Society, the second Tues-

day of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

**ILLINOIS**—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

**INDIANA**—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month, except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

**IOWA**—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa.

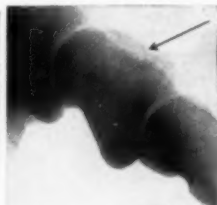
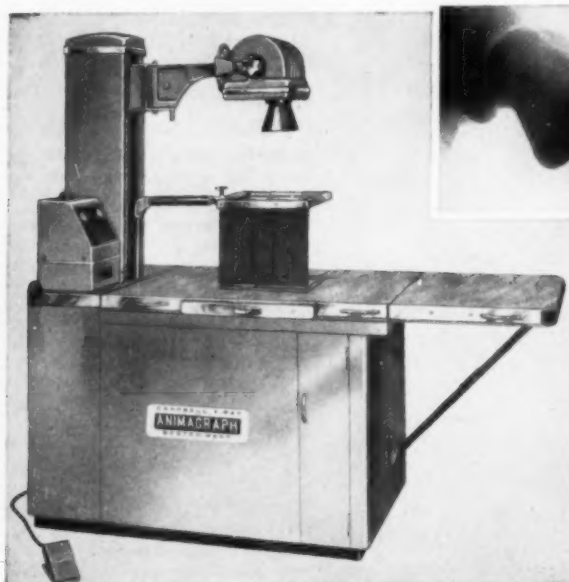
H. V. Henderson, Reinbeck, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Winselick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

(Continued on p. 36)



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**immunize against distemper and  
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one single shot...**

Sin-jex is the first vaccine to utilize a vacuum-dried modified live virus distemper fraction, with killed virus hepatitis fraction as diluent! This modified live virus distemper fraction elicits a more marked response; hence, Sin-jex assures more positive immunity.

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**KENTUCKY**—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

**MARYLAND**—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

**MICHIGAN**—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

**MISSOURI**—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Mercalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas

City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 3, Mo., secretary.

**NEW JERSEY**—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. F. B. Duke, 49 Taylor St., High Bridge, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the third Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. W. E. Snyder, E. Kings Highway and Munn Ave., Haddonfield, secretary.

**NEW YORK**—New York City, Inc., Veterinary Medical Association of the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

**NORTH CAROLINA**—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association.

(Continued on p. 42)



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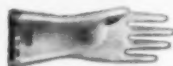


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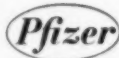
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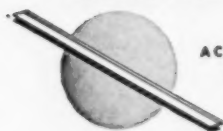
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The newly formed company, to be known as Haver-Lockhart Laboratories, will maintain its headquarters offices and two manufacturing plants in Kansas City, and will continue to adhere to the policy of sales to graduate veterinarians only, which has been observed by both firms in the past.

Dr. Knappenberger will continue to serve as president of the combined companies. Mr. Cliff V. Haver, who relinquished active control of his pharmaceutical company earlier this year, will remain as a member of the board of directors.

The salt consumed in Delhi, India, is made from sea water and has a high fluoride content which probably accounts for the local low rate of tooth decay.—*Sci. News Letter*, June 30, 1956.

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glucocorticoid  
activity..."*



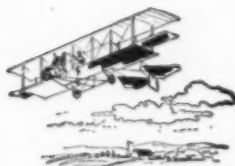
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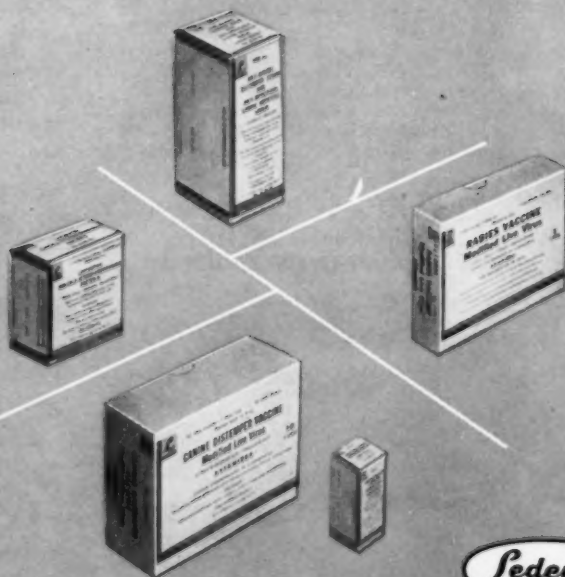
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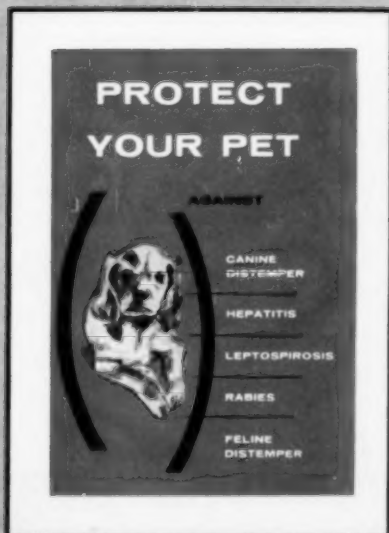
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the first Friday of each month. Wm. Allen Potts, 401 W. James St., Mount Olive, secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

Redmont Veterinary Medical Association, the last Tuesday of the month. J. L. Innes, 9 Tampa Ave., West Asheville, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month. James M. Brown, 2818 W. Britton Rd., Oklahoma City, secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel

in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary St., Richmond 20, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, Va., secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R. Des Rosiers, 5508 2nd Ave., N. W., Seattle 7, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. L. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowa (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W., Huntington, W. Va., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

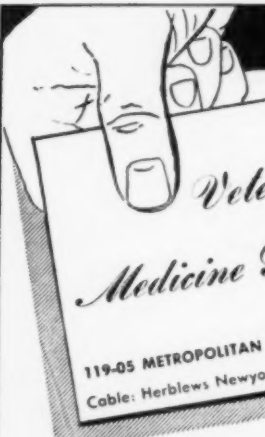
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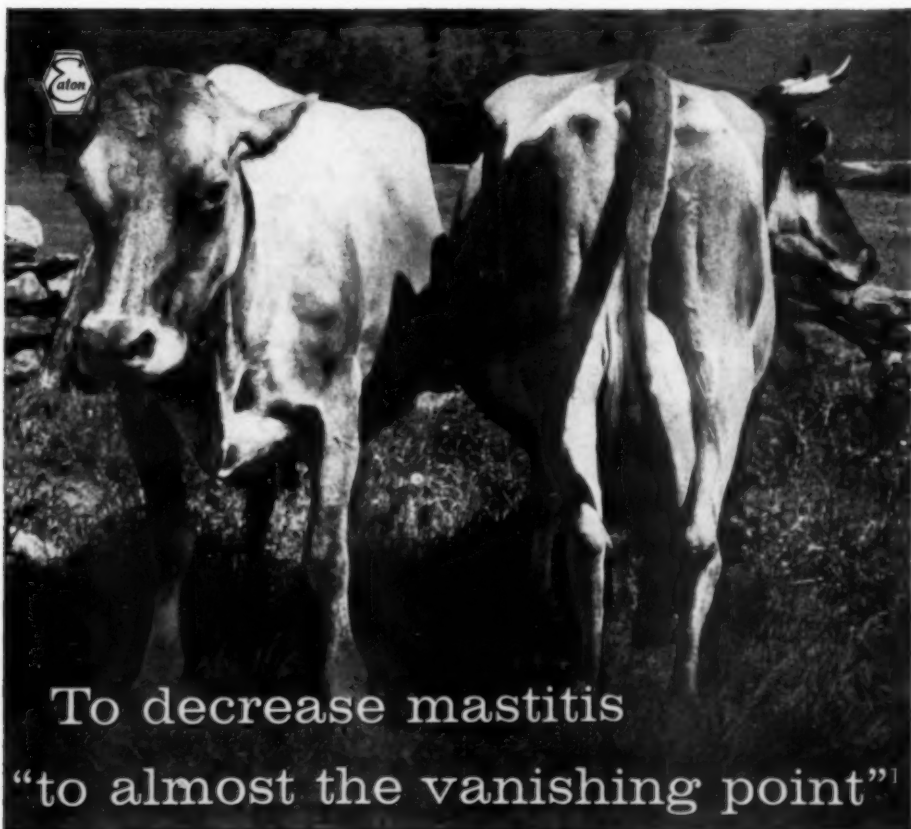
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1. Kokovos, J. C., et al.: J. Am. Vet. M. Ass. 19:203 (Sept.) 1951.

2. Kokovos, J. C.: Antibiotics Annual 1954-55, New York, Medical Encyclopedia, Inc., 1955, p. 323.

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(Continued on p. 45)

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(Continued on p. 46)

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weatherproof plastic signs will  
dress-up your office or clinic.  
All sizes, colors; easily  
installed. Write for folder N-5.



### hi-current electric firing iron

Most modern, up-to-date way to  
fire horses, remove warty  
growths, ear polyps, tumors.  
Complete with 11 points/tips.  
Write for folder N-6.

- ☐ folder N-1 Cases ☐ folder N-2 Plasti-Plate ☐ folder N-3 "B" irons  
☐ folder N-4 syringe cases ☐ folder N-5 sign letters ☐ folder N-6 firing irons

Please send me the folders I've checked above.

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street

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now more palatable...

# iodal

## WITH SUGAR BASE

organic iodide supplement for poultry and livestock

New Iodal Powder with sugar base contains the same high iodine content as the Iodal salt base product. While the new sugar base is more palatable than the salt base, both forms offer the same wide range of usefulness as organic iodide supplements and conditioners for livestock and poultry. Iodal Powder is neutral, non-irritating to gastric mucosa and is almost odorless.

Mix in feed or drinking water or administer as a drench.

contains betaine

Recommended as an aid in the treatment of conditions believed resulting from insufficient iodine intake such as foot rot, actinomycosis, chronic bronchitis and laryngitis, mastitis, preparturient edema, ketosis, calf diphtheria, necrotic enteritis, infertility and other conditions.



Supplied: 1 lb. or carton  
12-1 lb. (dispensing labels)  
The new sugar base Iodal is  
a distinctive green color.

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*Laboratories*  
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# alva...

**now in the new 50-dose bottle  
is ready to go to work in seconds!**



Alva, Lockhart's erysipelas vaccine avirulent, is now available in a 50-dose package. Because of an exclusive new Lockhart process, 50-dose Alva reconstitutes in seconds . . . is ready to go to work immediately to provide a safe, durable erysipelas immunity.

Alva is vacuum stoppered for greater stability, desiccated for maximum potency . . . a live culture vaccine that is effective and economical. Alva may be used without serum unless pigs have been exposed to or infected with erysipelas.

In addition to Alva in 5, 25, and 50-dose packages, Lockhart also offers you Erysipelothrix Rhusiopathiae Vaccine, Erysipelas Bacterin and Anti-Swine Erysipelas Serum.

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blood  
calcium  
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SPECIAL CONCENTRATION

DCM Special Concentration's exclusive, patented calcium salts make possible higher blood calcium and magnesium levels for longer periods. A free-flowing solution, DCM Special Concentration is low in toxicity and almost neutral in pH for minimum tissue irritation. Given intravenously, subcutaneously or intraperitoneally, DCM Special Concentration provides optimum calcium levels at only  $\frac{1}{2}$  cc. per pound of body weight. Supplied in cartons of 12—500 cc. vials. Specify "special concentration" on your order.



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